LA-UR-15-26731
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Title:	Storm Water Pollution Prevention Plan for: Sigma Complex & MST Metal Fabrication Facilities Los Alamos National Laboratory
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Intended for:	Environmental Programs
Issued:	2015-08-28 (rev.1)

Storm Water Pollution Prevention Plan

for:

Sigma Complex & MST Metal Fabrication Facilities
Los Alamos National Laboratory
Los Alamos, NM 87544

SWPPP Contact(s):

Science & Technology Operations Facilities Operations (STO-FOD) Division
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Rev 0: JUNE 2015

Sigma Complex & MST Metal Fabrication Facilities
Storm Water Pollution Prevention Plan
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SECTION 1: FACILITY DESCRIPTION AND CONTACT INFORMATION

1.1 Facility Information

Facility Information

Name of Facility: Sigma Complex & MST Metal Fabrication Facilities, Buildings 0141, 0159, and 0169
Street: Los Alamos National Laboratory, Technical Area 03
City: Los Alamos State: NM ZIP Code: 87545
County or Similar Subdivision: Los Alamos County
Permit Tracking Number: NMR050000 (if covered under a previous permit)

Latitude/Longitude (Use **one** of three possible formats, and specify method)

Latitude:	Longitude:
1. 3 5 º 5 2 ' 1 8" N (degrees, minutes, seconds)	1. 1 0 6 º 1 9 ' 0 4" W (degree, minutes, seconds)
2. _ _ º _ _ . _ _' N (degrees, minutes, decimal)	2. _ _ º _ _ . _ _' W (degrees, minutes, decimal)
3. _ _ . _ _ _ _ º N (decimal)	3. _ _ . _ _ _ _ º W (decimal)

Method for determining latitude/longitude (check one):
☐ USGS topographic map (specify scale:________________) ☒ EPA Web site ☐ GPS
☐ Other (please specify): ______________________________

Is the facility located in Indian Country? ☐ Yes ☒ No
If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable."____________________

Is this facility considered a Federal Facility? ☒ Yes ☐ No

Estimated area of industrial activity at site exposed to storm water: 8.7 (acres)

Discharge Information

Does this facility discharge storm water into an MS4? ☐ Yes ☒ No

If yes, name of MS4 operator: __

Name(s) of water(s) that receive storm water from your facility Sandia Canyon and Upper Mortandad Canyon (Tributaries to the Rio Grande)

Are any of your discharges directly into any segment of an "impaired" water? ☒ Yes ☐ No

If Yes, identify name of the impaired water (and segment, if applicable): Sandia Canyon (Sigma Canyon to NPDES outfall 001) Assessment Unit NM-9000.A_047 and Mortandad Canyon (within LANL) Assessment Unit NM-9000.A_042

Identify the pollutant(s) causing the impairment: Total Aluminum, PCBs, Acute Copper, Dissolved

Thallium and Adjusted Gross Alpha.

For pollutants identified, which do you have reason to believe will be present in your discharge?
Dissolved Thallium

For pollutants identified, which have a completed TMDL? None

Do you discharge into a receiving water designated as a Tier 2 (or Tier 2.5) water? ☐ Yes ☒ No

Are any of your storm water discharges subject to effluent guidelines? ☐ Yes ☒ No

If Yes, which guidelines apply?

Primary SIC Code or 2-letter Activity Code: 3398, 3399,3441

Identify your applicable sector and subsector: Sectors F (subsector F5) and AA (subsector AA1)

1.2 Contact Information/Responsible Parties

Facility Operator (s):
Name: LANS, LLC
Address: PO BOX 1663 MS K490
City, State, Zip Code: LOS ALAMOS, NM 87545
Telephone Number: (505) 665-3741

SWPPP Contact:
Name: Holly Wheeler
Telephone number: (505) 667-1312
Email address: hbenson@lanl.gov

Facility Contact:
STO-FOD Office: (505) 667-7988
STO Duty Officer #1: (505) 664-3865
STO Duty Officer #2: (505) 664-4444
Fax number: (505) 665-5236

1.3 Storm Water Pollution Prevention Team (PPT)

Staff Names	Individual Responsibilities
STO-FOD Division Leader	Responsible for the operations and maintenance of all aspects of the buildings and facilities listed within this Plan.
STO-FOD DSESH Group Leader	Responsible for the management of all environmental, safety, health, and quality programs for the buildings and facilities listed within this Plan. This includes performing oversight and periodic walk downs to ensure implementation of the requirements of the MSGP and this SWPPP including overseeing the assigned duties of other PPT members. The

	Group Leader is responsible for ensuring that problems noted in inspections are corrected. The Group Leader must also ensure funding is established to cover compliance requirements of the MSGP and this SWPPP.
STO-FOD Deployed Environmental Professional (DEP)	Responsible for the management of all environmental programs and issues for the buildings and facilities listed within this Plan. The DEP is responsible for training, recordkeeping, and SWPPP revision. The DEP will ensure that all PPT, operations site workers (as appropriate), and applicable supervisors receive annual MSGP and SWPPP training. The DEP will ensure that inspection documents and other required MSGP records relative to the SWPPP are managed in accordance with the permit and established document control procedures and that the SWPPP is kept current. The DEP provides technical and regulatory support to Sigma Complex personnel and those at “no exposure” facilities within the STO FOD regarding implementation of the MSGP and this SWPPP. Lastly, the DEP conducts routine inspections and visual assessments as required by the MSGP (if trained and qualified to do so). Identified corrective actions from routine inspection are entered into the ENV-CP Corrective Action Report (CAR) database. The DEP is responsible for tracking and updating the status of corrective actions that cannot be implemented immediately.
STO-FOD Facility Manager	Responsible for managing the operation and maintenance of all aspects of the buildings and facilities listed within this Plan. The Facility Manager shall provide review and ensure coordination with core personnel and the PPT, as appropriate, when tenants within the STO FOD propose a new process or a new site or operation that may be subject to the MSGP.
Materials Science and Technology-Metallurgy (MST-6) Group Leader	Responsible for managing the operation of all MST-6 staff and equipment. MST-6 is currently managing beryllium and metal fabrication activities inside TA-03-0066. This includes performing oversight and periodic walk downs to ensure implementation of the requirements of the MSGP and this SWPPP at sites subject to the MSGP.
Condensed Matter and Magnet Science (CMMS) Group Leader	Responsible for managing the operation of all CMMS staff and equipment. This includes performing oversight and periodic walk downs to ensure implementation of the requirements of the MSGP and this SWPPP at sites subject to the MSGP.
STO-FOD Waste Management Coordinator Team	Responsible for overseeing waste management activities for the STO-FOD Division and for the TA-03-0066 facility.

ENV-CP MSGP Project Lead	The MSGP Project Lead is responsible for managing and administering the Multi-Sector General Permit Storm Water Program for all industrial facilities within Los Alamos National Laboratory. The MSGP Project Lead advises and provides guidance to facility personnel on NPDES MSGP regulations/requirements. The MSGP Project Lead also acts as the institutional point of contact for all interactions with the regulatory authority (EPA) and supervises personnel implementing storm water monitoring requirements for the facility. ENV-CP conducts the Comprehensive Site Inspection annually. This is usually done by the MSGP Project Lead, but may be conducted by any trained or qualified person within ENV-CP.

1.4 Activities at the Facility

This section provides a general summary of activities occurring within the facilities covered by this Plan, as required in Part 5.2.2 of 2015 MSGP.

1.4.1 Sigma Complex

The Sigma Complex (Building TA-03-0066), the Beryllium Technology Facility (BTF) (TA-03-0141), the Thorium Storage Building (TA-03-0159), the Warehouse (TA-03-0169) and several other small support structures make up the Complex. The facility is enclosed by a security fence and site access is controlled by a security gate opened only with a LANL badge. The Complex is currently used for materials synthesis as well as for processing, characterizing and fabricating metallic and ceramic items, including depleted uranium (DU) items used in the U.S. Department of Energy (DOE) Stockpile Stewardship and Management Program.

The Sigma Complex is classified as a radiological, moderate-hazard facility. TA-3-66 contains laboratories for metallurgical and ceramics projects, offices and administrative spaces, and storage areas for hazardous chemicals (concentrated acidic and caustic solutions) and mechanical ventilation systems. Machining and metal fabrication facilities are located throughout this building.

The BTF is classified as a non-nuclear, moderate-hazard facility. The BTF is 16,000 square-feet (ft^2) in size. Of this total, approximately 13,000 ft^2 of the building has been converted to house a facility for beryllium operations. The remaining 3,000 ft^2 of the facility is used for general metallurgical operations.

The Thorium Storage Building is classified as a radiological, low-hazard facility. This building is located in the southeastern corner of the Complex. The building is made of concrete and has no electrical or water utilities connected to it. The activities located in this part of the Complex are outside storage of low-level radiological waste storage containers, at the northeast corner of the building.

The Warehouse is classified as a radiological, low-hazard facility. The building is used to store radioactive waste and chemicals for the Complex.

1.4.2 TA-3 Metal Fabrication Shops

The Metal Fabrication Shops within STO FOD at TA-03 are located on the western portion of the Complex, outside the security fence.

General Location Map

The facilities described within this Plan drain storm water to Upper Mortandad and Sandia Canyons. Both of these canyons are tributaries to the Rio Grande, which is located approximately five miles to the east of the facility discharge points. The general location map for this facility can be seen in Appendix A.

Site Map

Copies of the site maps for the facilities located within the Complex can be found in Appendix B. The following information is contained in these maps:

the site is approximately 8.7 acres;
the location and extent of significant structures and impervious surfaces;
directions of storm water flow;
locations of existing structural control measures;
locations of all receiving waters in the immediate vicinity of the Sigma Complex;
locations of all storm water conveyances including ditches, pipes, and swales;
locations of potential pollutant sources identified under MSGP, Part 5.2.3.2;
no significant spills or leaks have occurred that meet the definition identified in Part 5.2.3.3;
locations of the two l storm water monitoring points;
locations of storm water inlets and outfalls, and an approximate outline of the areas draining to each outfall;
locations and descriptions of all non-storm water discharges identified under MSGP, Part 2.1.2.9;
locations of the following activities where such activities are exposed to precipitation:
loading/unloading areas;
locations used for the treatment, storage, or disposal of wastes;
processing and storage areas;
immediate access roads used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
transfer areas for substances in bulk;
machinery; and
locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants. There are no run-on sources with significant quantities of pollutants so this is not applicable.

SECTION 2: POTENTIAL POLLUTANT SOURCES

This section of the Plan contains descriptions of areas within the complex where industrial materials or activities are exposed to storm water and from which allowable non-storm water discharges are released. The elements required by MSGP Part 5 are detailed within this section.

Industrial Activity and Associated Pollutants

In order to meet the required elements of MSGP Parts 5.2.3.1 and 5.2.3.2, the following table contains a list of industrial activities exposed to storm water (e.g., material storage; equipment/vehicle fueling, maintenance, cutting steel beams) and the pollutants or pollutant constituents (e.g., motor oil, fuel, battery acid, and cleaning solvents) associated with these activities. In addition, to these items, the list includes all significant materials that have been handled, treated, stored, or disposed, and that have been or could be exposed to storm water. The use of cover bins, inlets, and good housekeeping are used as best management practices to minimize pollutants in storm water.

The information contained in the following table is divided into three major categories: (1) Activities associated with primary metal facilities operations; (2) Fabricated metal products industry operations; and (3) Significant quantities of materials stored in support of primary and fabricated metal operations.

Industrial Activity	Associated Pollutants	Locations of Activity	Outfall
Primary Metal Facilities Operations			
Ceramic firings[1, 2]	Sulfur and nitrogen oxides	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Ceramic sample preparation[1, 2]	Aluminum	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Dry & wet ceramic processing[1, 2]	Aluminum	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Machining of uranium & graphite[2]	Depleted Uranium Graphite	TA-03-0066 (Sigma Building)	All outfalls (013-020) affected.
Outdoor storage of graphite	Graphite	North end of TA-03-0066 (Sigma Building)	All outfalls (013-020) affected.
Machining of beryllium[2]	Beryllium	TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.

Industrial Activity	Associated Pollutants	Locations of Activity	Outfall
Fabricated Metal Products Industry Operations			
Electroplating[2]	Copper	TA-03-0066 (Sigma Building)	All outfalls (013-020) affected.
Fabrication of beryllium powder metallurgy components[2]	Beryllium	TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Foundry operations[2]	Aluminum Cast Iron Steel Magnesium Copper Tin Zinc	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Machining of Beryllium[2]	Beryllium	TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Machining of depleted uranium & graphite[2]	Depleted Uranium Graphite	TA-03-0066 (Sigma Building)	All outfalls (013-020) affected.
Materials characterization & inorganic chemical synthesis[2]	Depleted Uranium Other radiogenic isotopes, as required by experiments Tin Chromium Nitric Acid Hydrochloric Acid Sulfuric Acid	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Mechanical metallurgy[2]	Tin Chromium Experimental Composites Aluminum Steel	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Mechanical testing[2]	Experimental Composites Aluminum Beryllium Steel	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Microscopy & metallurgy[2]	Experimental Composites Aluminum Beryllium Steel Ceramic Materials	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Microwave processing[2]	Experimental	TA-03-0066 (Sigma	All outfalls (013-020)

Industrial Activity	Associated Pollutants	Locations of Activity	Outfall
	Composites Silicon Carbide Aluminum Oxide Ceramic Materials	Building)	affected.
Powder metallurgy[2]	Erbium Oxide Ceramic Materials Experimental Composites Beryllium	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Powder research & development[2]	Erbium Oxide Ceramic Materials Experimental Composites Beryllium	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Sintering operations[2]	Ceramic Materials Experimental Composites Beryllium Graphite	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Machining/milling[2]	Iron Tin Steel Aluminum Chromium Zinc Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Lathe operations[2]	Iron Tin Steel Aluminum Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Grinding[2]	Iron Tin Steel Aluminum Chromium Zinc Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)[3]	All outfalls (013-020) affected.
Cutting[2]	Iron Tin Steel Aluminum Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Soldering[2]	Iron	TA-03-0066 (Sigma	All outfalls (013-020)

Industrial Activity	Associated Pollutants	Locations of Activity	Outfall
	Tin Steel Aluminum Experimental Alloys	Building)	affected.
Brazing[2]	Iron Tin Steel Aluminum Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Sanding[2]	Iron Tin Steel Aluminum Chromium Zinc Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)[4]	All outfalls (013-020) affected.
Welding[2]	Iron Tin Steel Aluminum Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.
Cleaning (Dry or wet)[2]	Iron Tin Steel Aluminum Rinse Water[2,6,7] Chromium Zinc Experimental Alloys	TA-03-0066 (Sigma Building) TA-03-0141 (Beryllium Tech. Fac.)	All outfalls (013-020) affected.

Significant Stored Materials		
Material	**Location**	**Outfall**
Solid graphite & other non-corrosive metals	TA-03-0066 (Sigma Building)	013, 014, 016, 017, 018, 019
Graphite Dust	TA-03-0066 (Sigma Building)	013, 014, 016, 017, 018, 019
Diesel Fuel[5]	TA-03-0066 (Sigma Building)	013, 014, 016, 017, 018, 019
Carbon Material	TA-03-0066 (Sigma Building)	013, 014, 016, 017, 018, 019
Non-corrosive or Steel Feedstock	TA-03-0066 (Sigma Building)	013, 014, 016, 017, 018, 019
Miscellaneous Equipment	Throughout Complex	013-020
Low-level Radioactive Waste	TA-03-0066 (Sigma Building)	013, 014, 016, 017,

Industrial Activity	Associated Pollutants	Locations of Activity	Outfall
			018, 019
Solid Beryllium		TA-03-0141 (Beryllium Tech. Fac.)	015, 020
Oil Storage Area		East of TA-03-0066	013, 014, 016, 017, 018, 019
Beryllium waste		North and east of TA-03-0066	013, 014, 016, 017, 018, 019
Metal for recycle		North and east of TA-03-0066	013, 014, 016, 017, 018, 019
Wood for recycle		East of TA-03-0066	013, 014, 016, 017, 018, 019

Notes:
Ceramic materials fabricated at the Complex are often experimental and one-of-a-kind materials. A separate NEPA review is conducted for these operations to determine environmental impacts.
Activity takes place indoors. No exposure to storm water.
Activity involves grinding with hand-tools only.
Activity involves polishing of fabricated parts via light sanding.
Current fuel and oil inventories have not exceeded 1,320 gallons of aggregate storage, which would trigger the need to write and implement a Spill Prevention, Control, and Countermeasure Plan in accordance with 40CFR112. If in the course of routine, quarterly, and annual site inspections, the inspector determines that this limit has been exceeded, the Complex will have the opportunity to manage its inventory to a level below this volume or will be required to write and implement an SPCC Plan.
These drains are routed to the Radioactive Liquid Waste Treatment Facility via the Radioactive Liquid Waste Line.
Whenever possible, environmentally friendly cleaners and solvents are used.

2.2 Spills and Leaks

MSGP Part 5.2.3.3 requires that this Plan contain a description of where potential spills and leaks could occur at the Complex that could contribute pollutants to your storm water discharge, and specify which outfalls are likely to be affected by such spills and leaks.

The following table lists a description of locations at the Complex where potential spills and leaks could occur. The information was developed by walking through the complex and evaluating storage areas and utility lines. There is still the potential for spills and leaks to occur at other locations in the Complex; however, these areas were evaluated as having the greatest potential for spills and leaks to occur in their vicinity. Spills that do occur are to be cleaned up immediately.

Areas of Site Where Potential Spills/Leaks Could Occur	
Location	Outfalls
Utility lines (water, sanitary sewage, unauthorized cooling tower discharge, steam condensate) located throughout the facility.	All
Oil storage area located to the south of TA-03-0169	Southeast outfall discharging to Mortandad Canyon (015)

Diesel storage on Loading Dock #1at TA-03-0066 Used Oil Storage Area at Dock #2 at TA-03-0066	North outfalls discharging to Sandia Canyon (018 and 019)
Waste oil storage area located to the north of the loading dock located to the east of TA-03-1698	Northeast outfall discharging to a swale, detention pond, then to Sandia Canyon

MSGP Part 5.2.3.3 requires that this Plan list a description of significant spills and leaks in the past 3 years of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm water conveyance. Please note that ☐significant spills
oil or hazardous substances in excess of quantities that are reportable under Clean Water Act (CWA) Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC §9602.

The following table lists a description of past spills and leaks that have occurred at the Complex. The information was obtained via a database maintained by LANL's ENV-CP Group. Some of the information does not contain a great deal of detail; however, in the interest of meeting the reporting requirements outlined in Part 5.2.3.3 of the 2015 MSGP, the information is presented below. Appendix C contains a Spill Occurrence Log that will be used to document any future spills within the Complex. All unauthorized non-storm water discharges (those not identified in Part 1.1.3.1 of the MSGP) and spills are also to be included as a corrective action in the ENV-CP Corrective Action Reporting (CAR) database.

	Description of Past Spills/Leaks		
Date	Description	Outfalls	Corrective Actions Taken
05-13-2005	A tube failed on a chilled water unit inside TA-03-0141. Approximately 200 gallons of treated chilled water flowed out of the equipment room and onto the asphalt surface outside the building. The chiller was secured and the tubing was replaced. The room and area outside the building was roped off until radiological swipes could be taken. The swipes were negative for any radiological constituents.	None	Chiller unit was shut down to stop the release. The discharged water evaporated.
03-11-2008	A buried steam condensate line began leaking, which led to approximately 200 gallons of steam condensate being released to the surface. The steam condensate flowed onto an asphalt surface and into a storm water drainage system	Southeast outfall discharging to Mortandad Canyon	Repairs were completed on the steam condensate line to stop the discharge.

	before entering Upper Mortandad watercourse. The water flowed over Solid Waste Management Units (SWMUs) 03-0405(h) and 03-049(a) before entering the watercourse. No erosive impacts to the SWMUs or the watercourse were noted.		
10-27-2009	*Small amount of diesel spilled from a Gov't vehicle while at the guard gate.*	*None*	
3-26-2010	*A small amount of oil spilled onto the ground while moving a metal recycle bin. Oil was tested and was non-PCB.*	*None*	*Absorbent was applied to the impacted area to remediate the release.*
8-4-2010	*Cooling Tower overflow of approx...30 gals.*	*None*	*Flow to the cooling tower was turned off to stop the overflow/release.*
4-17-2014	*Cooling Tower make up water basin had a very small leak. Less than a gallon.*	*None*	*Upon discovery of the release a work ticket was created to fix the leak.*
1-7-2015	*During a PM performed by an off-site contractor The STO F.R. observed the contractor rinsing a set of cooling coils. The water, chemical mix entered a storm drain. Release was on asphalt, no erosion and it did not flow over a PRS.*	*Southeast outfall discharging to Mortandad Canyon*	*Work was paused upon discovery of the release. The residual discharge material was removed.*

2.3 Non-Storm Water Discharges Documentation

Date of evaluation: 8-25-2015
Description of the evaluation criteria used: Visual inspection and walkdown which involved visually sighting and evaluating potential sources of non-storm water discharges.
List of the outfalls or onsite drainage points that were directly observed during the evaluation: All site drainage points were observed (outfalls 013-020).
Different types of non-storm water discharge(s) and source locations: There were no non-storm water discharges observed during the inspection.
Action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), if any were identified. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an NPDES permit application was submitted for an unauthorized cooling water discharge: None.

2.4 Sampling Data Summary

All analytical sampling events at MSGP monitored outfalls at LANL are managed by ENV-CP and tracked by Operations Integration Office (OIO). OIO maintains the Storm Water Tracking System (SWTS) and the Environmental Information Management (EIM) application, which is a web based software-as-a-service application. The current year MSGP sampling and analysis plan is entered into EIM. It then generates the chain of custody forms and retains validated data once returned from an off-site laboratory. SWTS is used to generate the MSGP Discharge Monitoring Reports by pulling the analytical data from EIM to populate the MDMRs. ENV-CP provided EIM download of data on 8/27/2015. Data for TA-03-0039 can be seen in Appendix K. No exceedances occurred at Sigma while monitoring occurred under the old 2008 MSGP. The monitoring data for Sigma (labeled TA-03-0141 and Sandia Tributary below Sigma) can be seen in Appendix K. .

SECTION 3: STORM WATER CONTROL MEASURES

3.1 Minimize Exposure

To minimize exposure of industrial activities in precipitation events the Complex utilizes covers for scrap, waste, recycle-able containers and roll-off bins and are typically stored throughout the Complex. Along with this all dumpster lids are kept closed when not in use. However, it is not possible to store all the materials, related to Complex industrial activities that have the potential to be released with storm water discharges undercover. The table shown below lists materials located at the Complex that have the potential to be released with storm water discharges, and the method(s) used to minimize the exposure of these materials to storm water. In the event of a spill or leak (section 3.4) dry methods are used to clean up these promptly.

Location	Activity	Control Measure
TA-03-0141 & 03-0066	Storage of low-level radioactive waste	Material is stored in sealed containers and locked low-level waste burial boxes and transportainers.
TA-03-0066	Loading and unloading materials	Activity is conducted in covered loading dock attached to certain

		docks surrounding the building.
TA-03-0141	Storage of beryllium waste	Material is stored inside Building TA-03-0317 and transportainers, which are closed and locked.

Good Housekeeping

Operations personnel at the Complex perform weekly inspections/rounds at the facility which are focused toward keeping the site clean, spills prevention and detection, and identification of potential compliance issues. Maintenance of the containment structures and storm water conveyances is essential to good housekeeping. Storm water controls are cleaned as necessary to prevent clogging and promote proper operation. Containers susceptible to spillage or leakage are plainly labeled to encourage proper handling and facilitate rapid response if spills or leaks occur. If a spill is witnessed, call the Emergency Response Group (SEO-1) Office at 667-6211. If fire or an explosion is occurring, or if the potential for such exists, the situation must be reported by dialing 911 from a non-cellular phone or by activating a fire pull box. In the event of a spill, SEO-1 will determine appropriate cleanup procedures and will notify the individuals or organizations responsible for completing regulatory reporting requirements. The DEP or other FOD personnel will have to complete a spill report and submit it the ENV-CP. The spill report will be handled according to ENV-CP-007, *Spill Investigations* (see Appendix J), and may require external agency notification, depending on the nature of the spilled material and the location of the release. All incidents shall be reported and evaluated in accordance with P322-3, *Performance Improvement from Abnormal Events* (see Appendix J).

3.3 Maintenance

The PF-DO Representative and or the STO Operations manager must regularly inspect, test, and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater that is discharged to receiving waters. The facility must maintain all control measures that are used to achieve the effluent limits required by this permit in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If the facility finds that their controls need to be replaced or repaired, they must make the necessary repairs or modifications as expeditiously as practicable. Documentation of Maintenance and Repairs of Control Measures (BMPs) is entered in to the ENV-CP MSGP Corrective Action Reporting (CAR) database.

The following items are checked daily and again during the monthly inspections:

Ensure that facility grounds are in an orderly condition

Ensure that stormwater structures are free of debris, floating material or other obstructions

Identify maintenance needs for equipment or stormwater BMPs

Identify signs of new erosion

Identify signs of leaks, spills, or other releases

If a problem is found that cannot be immediately remedied, the inspection and the response are documented in the ENV-CP Corrective Action Reporting database and an expected completion date is identified.

At the Complex, preventive maintenance is performed on all vehicles on a six-month schedule outside the Complex, subject to GSA Fleet requirements. Facilities personnel perform weekly facility rounds at the Complex. These rounds would identify any facility maintenance issues associated with the structural BMPs on site. Also, the inspections of the facility by the SWPP Team identifies corrective measures necessary for maintaining the structural storm water controls in proper operating condition and maintaining working stormwater drains. Baghouses are inspected and maintained at least quarterly to prevent escape of dust from the system and immediately removing any accumulated dust at the base of the exterior baghouse. With respect to machining operations at the Complex, all operations are controlled through general housekeeping and routine custodial maintenance.

3.4 Spill Prevention and Response

At present, the Complex does not require a Spill Prevention, Control and Countermeasure (SPCC) Plan as outlined in 40CFR112. The Complex manages its bulk oil storage to an aggregate level less than 1,320 gallons. If the inventory within the Complex rises above this level, the inventory will be required to be decreased or an SPCC Plan will be written for the Complex. Spill kits are located throughout the Complex, as detailed in the Facility Emergency Plan (see Appendix J).

The application of good housekeeping procedures (listed in STO Spill Response Procedure document PRO-0493-STO-HAZMAT and STO Generator Waste Operations document STO-OP-043 section 6.18) (see Appendix J) and the regular weekly visual inspections minimize the probability of a spill or release. Also, LANL's institutional procedures P409 Waste Management and P101-14 Chemical Management (see Appendix J) require labeling of wastes, used oils, and chemicals stored on-site to facilitate the proper handling and response if spills or leaks occur. P409 also identifies inspection requirements or waste containers.

Operational controls are implemented to minimize the possibility of any accidents resulting in spills or releases off site. In general, the approach to spill clean-up of a known substance is to first contain the spill by securing the spill source and deploying spill containment materials. If secondary containment is being provided (e.g. secondary containment pallets for liquids) it will contain the spill. Small spills are responded to by the operator involved in the spill or by the operator located in the vicinity. For incidental releases, absorbents are used to pick-up free liquids and the contaminated absorbents are properly disposed. Standard procedures for spill containment and clean up include the use of spill control kits, sorbent pillows, socks, sheets, and granules. Clean-up residues are managed as appropriate, and as determined by the facility waste management coordinator and ENV-CP personnel depending on the material spilled. Larger spills require that ENV-CP personnel be contacted to respond to the spill, securing the spill area and contacting LANL's SEO-1 Office at 667-6211.

The LANL SEO-1 Office has been appointed by the Laboratory Director as the organization responsible for emergency management at the Laboratory. The LANL SEO-1 Office will be notified if a spill cannot be easily controlled with the materials on hand, threatens to escape the facility or enter the environment, additional resources are needed, an unidentified hazard exists, injuries have occurred, fire protection is needed, or if operational or facility personnel are not adequately trained in the use of spill control equipment or are not confident in their ability to carry out spill response activities. They can be reached at 667-6211. If a fire or explosion is present, or if the potential for such exists, the situation must be reported by dialing 911 from a non-cellular phone or by activating a fire pull box. 911 should also be dialed in the event of an employee injury. In the event of a spill, the SEO-1 Office will notify the individuals or organizations responsible for the completion of spill reports or the fulfillment of regulatory reporting requirements. Spills will be managed in accordance with ENV-CP-007, *Spill Investigations* (see Appendix J).

The completion of a spill report is required in the event of a spill. The determination of whether a spill is reportable will be made by the SEO-1 Office or ENV-CP in accordance with Laboratory and U.S. Department of Energy (DOE) policies, and federal and state regulatory reporting requirements and ENV-DO-QP-101.2, *Environmental Reporting Requirements for Releases or Events* (see Appendix J). In addition to fulfilling reporting requirements, spill reports assist user Groups and Laboratory management in assessing the cause of a spill and in executing corrective action.

Two types of spill reporting are required at the Laboratory: internal spill record keeping and external agency notification. Copies of internal spill reports will be kept by the SWPPP Team member, ENV-CP and the responsible organization. External agency notification (as determined by ENV-CP personnel) may consist of verbal or written notification to the National Response Center, EPA Region VI, or the New Mexico Environment Department. All incidents shall be reported and evaluated in accordance with P322-3, *Performance Improvement from Abnormal Events* (see Appendix J).

The Complex utilizes the controls listed in the table below to aid in spill prevention and response.

Location	Activity	Control Measure
TA-03-0066	Storage of diesel drums Used Oil Storage Area	Drums are stored in secondary containment at Dock #1 of the building. Drums are stored in secondary containment at Dock #2
TA-03-0034 & 03-1698	Storage of drums of machinery lubricant	Drums are stored within a standardized secondary containment unit at both buildings.
TA-03-0034	Spill response	Absorbent material is located outside the metal shop door in a covered metal box.

Erosion and Sediment Controls

The areas surrounding operations at the Complex, including material and waste storage areas, are covered with asphalt. Along the southern fence border, to the southeast of Building TA-03-0141 (BTF), there is a large area covered with base course and riprap to slow the storm water, as it flows off of the asphalt. Water diversion channels have been constructed around the Complex buildings to direct storm water runoff away from any area that may contain pollutants. The areas surrounding the Complex buildings are paved with asphalt, thereby minimizing the potential for erosion from sites within the Complex. Holding ponds to the north end of the Complex help with velocity dissipation and sediment control. There are occasions that activities around the Complex grounds do cause soil to be exposed (i.e. repair of utility lines); however, once these activities cease, the exposed soil is covered with asphalt or compacted base course.

3.6 Management of Runoff

Most of the storm water drainage from the buildings at the Complex is directed underground to off-site drainage areas. These areas are covered with native vegetation and grass and do not pose any potential threat to the environment. Drainage that comes off the south end of the facility and drainage that occurs east of TA-3-141 where the sampler is does not go below ground. A berm around a portion of the Sigma Complex is used to prevent runoff of contaminated flows in this area. Holding ponds to the north end of the Complex help with velocity dissipation and sediment control.

3.7 Salt Storage Piles or Piles Containing Salt

There are no areas within the Complex that either cover or enclose salt storage piles or piles containing salt. The roads and parking lots surrounding the Complex are treated with salt during snow events in the winter. However, the salting operations are conducted by Logistics Division, Heavy Equipment Roads and Grounds, and the salt for these activities is stored at the LANL Roads & Grounds Facility at TA-60. The LANL Roads & Grounds Facility has a separate SWPPP to comply with 2015 MSGP. Please refer to that document for the controls used by that facility. Also, please note that there are small containers (5 – 10 gallon) containers of de-icing salt staged throughout the Complex grounds during the winter months; these smaller amounts of salt are used for spot de-icing on sidewalks and do not require storm water controls as defined in Part 2.1.2.7 of 2015 MSGP.

3.8 MSGP Sector-Specific Non-Numeric Effluent Limits

According to Part 2.1.2. of the 2015 MSGP, this Plan must describe controls and procedures to be used at the regulated facility to comply with sector-specific requirements that apply in Part 8 of the MSGP. Since the Complex involves operations and activities that fall under both Sector F – Primary Metals and Sector AA – Metal Fabrication, both sectors will be addressed in this section of the Plan.

3.8.1 Sector F Additional Technology-Based Effluent Limits

3.8.1.1 All Areas - Good Housekeeping Measures

The Complex's Good Housekeeping Program involves the periodic cleaning of all impervious areas of the facility where particulate matter, dust or debris may accumulate. Of particular importance to this program are the loading, unloading, storage, handling and processing areas throughout the Complex, which include the eight covered loading docks at TA-03-0066 (Sigma Building), the Graphite Dust Waste Storage Area to the north of TA-03-0066, the Beryllium Waste Storage Areas to the north of TA-03-0141 (BTF), the Oil Storage Area to the west of TA-03-0141, and the waste storage areas near TA-03-0066 and 0141. In addition to the periodic sweeping of the impervious surfaces near these areas, these areas are inspected on a weekly basis by the STO-FOD Operations Manager. Periodic inspections of waste management areas are conducted by the Waste Management Coordinator assigned to the Complex. The loading docks are high-visibility areas and are, by convention, cleaned up after each loading and unloading operation. The most troublesome area, with respect to the Good Housekeeping Program, is the Graphite Dust Waste Storage Area to the north of TA-03-0066; the waste containers in this area are covered at all times, and the area is swept as often as possible. . For additional information relative to spill prevention and response procedures refer to section 3.4 of this SWPPP.

3.8.2 Sector AA Additional Technology-Based Effluent Limits

3.8.2.1 Raw Steel Handling and Storage Areas

All scrap metals, fines, and iron dust is captured and contained in covered metal bins and sent to LANL's Material Recycling Facility to be stored and shipped out for recycling. All deliveries of raw materials go directly in the building therefore they are not stored outside and do not come in contact with storm water.

3.8.2.2 Paints and Painting Equipment

Painting activities and the storage of paints and painting equipment does not take place outdoors at the Complex. If fabricated machinery requires a coat of paint, it is typically taken to TA-35-0124 for indoor spray painting under a fume hood. TA-35-0124 is one of three machine shops located at TA-35 that conducts all operations indoors.

3.8.2.3 Metal Fabrication Areas

All metal fabrication activities take place indoors in clean, dry and orderly areas. DOE safety and industrial hygiene requirements help minimize the potential for pollutants to be exposed to storm water runoff.

3.8.2.4 Lubricating Oil and Hydraulic Fluid Operations

The potential for storm water contamination resulting from lubricating and hydraulic fluid operations at the Complex is minimized by storing all bulk material in secondary containment units at the locations shown in the site map contained in Appendix B. The graphite collection system and graphite storage area are located on the north side of TA-03-0066. Dust generation and minimization can be seen in Section 3.12 of this SWPPP.

Employee Training

Employee training is essential for effective implementation and maintenance of this SWPPP. All employees who work in areas where industrial material or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of the MSGP, including 1) Personnel who are responsible for the design, installation, maintenance and/or repair of controls (including pollution prevention measures); (2) Personnel responsible for the storage and handling of chemicals and materials that could become contaminants in storm water discharges; (3) Personnel who are responsible for conducting and documenting monitoring and inspections; and (4) Personnel who are responsible for taking and documenting corrective actions. Training will cover (1)An overview of what is in the SWPPP; (2) Spill response procedures, good housekeeping, maintenance requirements, and material management practices; (3) The location of all controls on the site required by this permit and how they are to be maintained; (4) The proper procedures to follow with respect to the permit's pollution prevention requirements; and (5) When and how to conduct inspections, record applicable findings, and take corrective actions. Personnel are required to be trained to ENV-CP-007, Spill Investigations (Appendix J).

All STO-FOD operational on-site workers, managers, and supervisors at the Complex as well as SWPPP team members will annually receive storm water pollution prevention training. This training is recorded in LANL's UTrain training database. In addition, the management of tenant groups within the Complex will be asked to develop a list of workers, supervisors and management that should take this training, due to their activities in either Primary Metal Operations or Metal Fabrication.

3.10 Non-Storm Water Discharges

There were no unauthorized non-storm water discharges identified during the site evaluation (See Section 2.3). However, please note that the potential for unauthorized cooling tower discharges and discharges from broken utility lines was identified as a potential pollutant source in Section 2.2 – Spills and Leaks.

The following are the non-storm water discharges authorized under this permit:
Discharges from emergency/unplanned fire-fighting activities;
Fire hydrant flushings;
Potable water, including water line flushings;
Uncontaminated condensate from air conditioners, coolers/chillers, and other compressors and from the outside storage of refrigerated gases or liquids;
Irrigation drainage;
Landscape watering provided all pesticides, herbicides, and fertilizers have been applied in accordance with the approved labeling;
Pavement wash waters where no detergents or hazardous cleaning products are used (e.g., bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols), and the wash waters do not come into contact with oil and grease deposits, sources of pollutants associated with industrial activities, or any other toxic or hazardous materials, unless residues are first cleaned up using dry clean-up methods (e.g., applying absorbent materials and sweeping, using hydrophobic mops/rags) and you have implemented appropriate control measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention; settlement);
Routine external building washdown/power wash water that does not use detergents or hazardous cleaning products (e.g., those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols);
Uncontaminated ground water or spring water
Foundation or footing drains where flows are not contaminated with process materials; and
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility , but not intentional discharges from the cooling tower (e.g., “piped” cooling tower blowdown: drains).

3.11 Waste, Garbage and Floatable Debris

STO-FOD operations and facility personnel perform weekly inspections/rounds to identify housekeeping issues (including waste items). Personnel remove all waste items and dispose of them in an appropriate manner. Portions of the Complex also have fences that surround portions of the facility where trash or other wind carried waste items can be caught prior to entering any storm- water conveyance.

3.12 Dust Generation and Vehicle Tracking of Industrial Materials

The Complex stores all scrap, waste and recyclable materials in covered bins or roll-offs. Bulk materials staging and storage is kept indoors, whenever possible. Industrial activities associated with Sectors F and AA are conducted indoors. Outdoor storage areas and associated controls have been summarized in Sections 3.1 and 3.4 of this Plan.

Dust generation is minimized by the controls shown in the following table:

Location	Activity	Control Measure
TA-03-0066	Process Activities	Graphite dust generated by process activities is collected via a permanently installed dust collection system to minimize the release of dust through the building’s exhaust stacks.
TA-03-0066 & 0141	Dust/waste Storage	Graphite dust is stored in sealed 55-gallon drums, with the drums stored in secondary containment units.
TA-03-0066	Process Activities	Filters on the dust collection system are replaced every two to five years, depending upon the amount of generated dust to ensure the removal system is working at maximum efficiency.
TA-03-0141	Process Activities	Beryllium waste generated by process activities is collected via a permanently installed waste collection system to minimize the release of waste through the Building’s cyclone stacks.
Entire Complex	Vehicle Operation	The Complex grounds are paved with asphalt, which minimizes the generation of dust associated with facility operations.

SECTION 4: SCHEDULES AND PROCEDURES FOR MONITORING

Analytical monitoring comprised of quarterly benchmark and annual impaired waters monitoring are performed on storm water discharges from the site. Monitoring events are from storm events that result in an actual discharge from the site and that follow the preceding measurable storm event by at least 72 hours (3 days). For runoff from snowmelt, the monitoring will be performed at a time when a measurable discharge from the site occurs.

Monitoring is conducted according to test procedures approved under 40 CFR Part 136. Runoff samples are collected by taking a minimum of one grab sample from a discharge, collected within the first 30 minutes of a measurable storm event. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, the sample will be collected as soon as practicable after the first 30 minutes and documentation will be kept with the SWPPP explaining why it was not possible to take samples within the first 30 minutes.

Samples are retrieved in accordance with *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP,* ENV-CP-QP-047 (see Appendix J). Stormwater samples are processed in accordance with *Processing MSGP Storm Water Samples,* ENV-CP-QP-048 (see Appendix J). All stormwater monitoring is conducted in accordance with the *Quality Assurance Project Plan for the Storm Water Multi-Sector General Permit for Industrial Activities Program,* ENV-CP-QAPP-MSGP (see Appendix J) and the current year MSGP *Field Implementation Plan*.

4.1 Monitoring Schedule

For this permit term, monitoring will begin in the first full quarter following October 1, 2015,. LANL is located in a high elevation, semi-arid climate where the majority of rainfall occurs during a period between July and September. Freezing conditions that would prevent runoff from occurring for extended periods may also occur during the winter months. Because of these conditions, monitoring events are distributed between April 1, and November 30 of each calendar year, during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the site (also see quarterly monitoring schedule below). If adverse weather conditions prevent the collection of samples according to the relevant monitoring schedule, a substitute sample will be collected during the next qualifying storm event or as soon as practical.

Benchmark monitoring will continue on a quarterly basis at least once in each of the following 2-month intervals:
April 1 – May 31;
June 1 – July 31;
August 1 – September 30; and
October 1 – November 30.

Impaired waters monitoring is performed on an annual basis with a sample collected in the period between April 1 and November 30.

4.2 Substantially identical Outfalls

This facility utilizes substantially identical outfalls for monitoring events. The outfalls have been identified as substantially identical based on common potential pollutant sources, drainage areas, activities within the drainage areas, and general site topography and characteristics. Required information supporting this outfall determination is as follows:

Location of the substantially identical outfalls: See the SWPPP Site Map. These are labeled as outfalls 013-019. Outfall 020 is not considered a substantially identical outfall because it collects water largely from a roof drain.
Description of the general industrial activities conducted in the drainage area of each outfall: See Section 2 of the SWPPP
Description of the control measures implemented in the drainage area of each outfall: See Section 3 of the SWPPP
Description of the exposed materials located in the drainage area of each outfall that are likely to be significant contributors of pollutants to storm water discharges: See Section 2 of the SWPPP
Estimate of the runoff coefficient of the drainage areas (low=under 40%; medium=40 to 65%; high =above 65%): High
Why the outfalls are expected to discharge substantially identical effluents: Similar activities, potential pollutant sources, and site characteristics

4.3 Summary of Monitoring Requirements

Sector F – PRIMARY METALS						
Monitoring Type	**Location**	**Parameters**		**Numeric Control Values**	**Schedule**	**Procedures**
Benchmark	Mortandad	Total Copper: (dissolved)	Hardness Dependent	0.008 mg/L	Quarterly	Automated samplers are installed in accordance with ENV-CP-QP-045, *Installing, Setting up, and Operating ISCO Samplers for the MSGP* (see Appendix J). . Samples are retrieved by ENV-CP personnel in accordance with ENV-CP-QP-047 *Inspecting Storm Water Runoff Samplers and*
		Total Zinc: (dissolved)	Hardness Dependent	0.101 mg/L		
	Sandia	Copper: (dissolved)		0.006 mg/L		
		Total Zinc: (dissolved)		0.076 mg/L		

Sector F – PRIMARY METALS						
Monitoring Type	**Location**	**Parameters**		**Numeric Control Values**	**Schedule**	**Procedures**
						Retrieving Samples for the MSGP (see Appendix J). Samples are processed for analysis in accordance with ENV-CP-QP-048, *Processing MSGP Storm Water Samples* (see Appendix J). Samples are sent to an off-site laboratory for analysis and data reporting by OIO personnel.
Impaired Waters	Mortandad Sandia	Aluminum Adjusted Gross Alpha Copper PCBs Aluminum Gross Alpha Copper Dissolved Thallium PCBs		1,699 µg/L 15 pCi/L 6 µg/L 0.00064µg/L 681 µg/L 15 pCi/L 6 µg/L 0.47 µg/L 0.00064 µg/L	Annual	Automated samplers are installed in accordance with ENV-CP-QP-045, *Installing, Setting up, and Operating ISCO Samplers for the MSGP* (see Appendix J). Samples are retrieved by ENV-CP personnel in accordance with ENV-CP-QP-047 *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP* (see Appendix J). Samples are processed for analysis in accordance with ENV-CP-QP-048, *Processing MSGP Storm Water Samples* (see Appendix J). Samples are sent to an off-site laboratory for analysis and data reporting by OIO

Sector F – PRIMARY METALS						
Monitoring Type	**Location**	**Parameters**		**Numeric Control Values**	**Schedule**	**Procedures**
						personnel.

Sector AA – FABRICATED METALS						
Monitoring Type	**Location**	**Parameters**		**Numeric Control Values**	**Schedule**	**Procedures**
Benchmark	Mortandad	Total Aluminum		0.75 mg/L	Quarterly	Automated samplers are installed in accordance with ENV-CP-QP-045, *Installing, Setting up, and Operating ISCO Samplers for the MSGP* (see Appendix J). Samples are retrieved by ENV-CP personnel in accordance with ENV-CP-QP-047 *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP* (see Appendix J). Samples are processed for analysis in accordance with ENV-CP-QP-048, *Processing MSGP Storm Water Samples* (see Appendix J). Samples are sent to an off-site laboratory for analysis and data reporting by OIO personnel.
		Total Iron		1.0 mg/L		
		Total Zinc	Hardness Dependent	0.101mg/L		
		Nitrate plus Nitrite Nitrogen		0.68 mg/L		
	Sandia	Total Aluminum		0.75 mg/L		
		Total Iron		mg/L		
		Total Zinc	Hardness Dependent	0.076mg/L		
		Nitrate plus Nitrite Nitrogen		0.68 mg/L		

Sector AA – FABRICATED METALS					
Monitoring Type	**Location**	**Parameters**	**Numeric Control Values**	**Schedule**	**Procedures**
Impaired Waters	Mortandad Sandia	Aluminum Adjusted Gross Alpha Copper Polychlorinated biphenyls (PCBs) Aluminum Copper Thallium (dissolved) Adjusted Gross Alpha PCBs	1,699 µg/L 15pCi/L 8 µg/L 0.00064µg/L 0.681 µg/L 6 µg/L 0.47 µg/L 15 pCi/L 0.00064µg/L	Annual	Automated samplers are installed in accordance with ENV-CP-QP-045, *Installing, Setting up, and Operating ISCO Samplers for the MSGP* (see Appendix J). Samples are retrieved by ENV-CP personnel in accordance with ENV-CP-QP-047 *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP* (see Appendix J). Samples are processed for analysis in accordance with ENV-CP-QP-048, *Processing MSGP Storm Water Samples* (see Appendix J). Samples are sent to an off-site laboratory for analysis and data reporting by OIO personnel.

4.4 Monitoring Results

If the average of the 4 monitoring values for any parameter exceeds the benchmark, or if prior to completion of 4 quarterly samples, an exceedance of the 4 quarter average is mathematically certain, the Pollution Prevention Team and ENV-CP personnel will:

Review the selection, design, installation, and implementation of your control measures to determine if modifications are necessary to meet the effluent limits,
Implement the necessary modifications, and
Continue quarterly monitoring until 4 additional quarters of monitoring have been completed for which the average does not exceed the benchmark.

If the average of the 4 monitoring values for any parameter does not exceed the benchmark, monitoring for that particular parameter will no longer be performed.

4.5 Recordkeeping

For each monitoring event, except snowmelt monitoring, the following information will be recorded and maintained through field data sheets, LANL database systems, and Discharge Monitoring Records:

The date, exact place, and time of sampling or measurements;
The date and duration (in hours) of the rainfall event
Rainfall total (in inches) for that rainfall event
Time (in days) since the previous measurable storm event
The individual(s) who performed the sampling or measurements;
The date(s) analyses were performed
The individual(s) who performed the analyses;
The analytical techniques or methods used; and
The results of such analyses.

For snowmelt monitoring, all information except rainfall event durations, totals, and time since previous event will be included. Additionally, all records of monitoring information, including all calibration and maintenance records will be maintained for a minimum period of at least three years from the date the permit expires.

SECTION 5: INSPECTIONS

5.1 Routine Facility Inspections

Routine inspections will be conducted and documented quarterly (Jan-March, April-June, July-September, October-December) by a qualified member of the SWPP Team (typically the Deployed Environmental Professional or ENV-CP Water Quality SME). Inspections will evaluate all monitoring data and quarterly visual assessment results in preparation for the inspection. The procedure used is ENV-CP-QP-022, *MSGP Stormwater Corrective Actions* (see Appendix J).

One routine inspection will be conducted during an active storm water discharge. Routine inspections will evaluate the following, at a minimum:

Inspection date and time;

The name(s) and signature(s) of the inspector(s);

Weather information:

A description of any discharge occurring at the time of inspection;

Any previously unidentified discharges from and/or pollutants at the site;

Any evidence of, or the potential for, pollutants entering the drainage system;

Observations regarding the physical condition and around the outfalls, including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;

Any control measures needing maintenance, repairs, or replacement;

Any additional control measures needed to comply with the permit requirements;

Any incidence or noncompliance; and

A statement signed and certified in accordance with Appendix B, Subsection 11 of the 2015 MSGP.

With respect to Sector F facilities, the 2015 MSGP states that inspections must address all potential sources of pollutants, including air pollution control equipment (e.g., bag houses, electrostatic precipitators, scrubbers, cyclones) must be inspected for signs of degradation(e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Air flow should be monitored at inlets and outlets to check for leaks or blockage in ducts. Also the 2015 MSGP requires Sector F facility inspections to examine all process and material handling equipment (e.g., cranes, conveyors and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g., piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material losses due to wind or storm water runoff.

With respect to Sector AA facilities, the 2015 MSGP states that inspections must, at a minimum, include the following areas in all inspections: raw metal storage areas, finished product storage areas, material and chemical storage areas, spent solvents and chemical storage areas, recycling areas, loading and unloading areas, equipment storage areas, paint areas, drainage from roof and vehicle fueling and maintenance areas.

Specific areas of the facility to be inspected include:

Note – air pollution control equipment in Buildings TA-03-0066 and 03-0141 will not be inspected during inspections covered by this plan. The stacks and cyclone separators are inspected and maintained on weekly, monthly, and quarterly schedules by qualified technicians and engineers. Rather than inspecting these systems during storm water inspections, the SWPP Plan inspector will review maintenance records, which document both preventive and corrective maintenance actions. Maintenance records for the TA-03-0066 dust collection system; filter replacement records for the dust control system in TA-03-0066; maintenance records for the permanent beryllium waste system in TA-03-0141; and stack emission records for the TA-03-0141 system will be reviewed on a quarterly basis under the SWPP program.

Waste storage areas near and around Buildings TA-03-0066 and 03-0141, including low-level radioactive waste stored in sealed containers and locked low-level waste burial boxes and transportainers will be inspected quarterly. Note that it will not be necessary to open these containers during the inspection process; rather, the containers will be examined for any degradation, and the areas surrounding the containers will be examined for evidence of pollutant transport and good housekeeping.

All loading areas for each of the buildings listed in the Plan will be inspected for good housekeeping practices, as well as for the potential of pollutants to be transported off site via storm water runoff. This includes the eight loading docks surrounding TA-03-0066;

The graphite dust waste storage area north of TA-03-0066 will be examined to ensure that all 55-gallon drums are covered and that the area is being swept and maintained on a regular basis.

The beryllium waste storage areas inside Building TA-03-0317 and around the transportainers, which are closed and locked shall be inspected for good housekeeping and will be examined for evidence of pollutant transport.

The scrap metal storage area near TA-03-0034 located in two cabinets outside the metal shop door will be inspected to ensure that all of the scrap metal generated here is stored inside the cabinets. In addition, the area will be examined for good housekeeping practices.

All equipment storage areas, whether temporary, or permanent shall be inspected for evidence of leaks and spills.

All outfalls from the Complex, including asphalt rundowns, swales, and drop inlets, will be inspected for evidence of the transport of pollutants off-site.

The SWPP Team member performing the inspection will document the inspection and will note potential storm water pollution problems that were encountered on the routine facility inspection form. Any required corrective actions identified during the inspection will be addressed in accordance with Section 5.4 Corrective Actions Process of this plan.

5.2 Quarterly Visual Assessments

The quarterly visual assessments will be conducted by a qualified member of the SWPP Team (Deployed Environmental Professional or ENV-CP Water Quality SME). The procedure used is ENV-CP-QP-064, *Multi-Sector General Permit Stormwater Visual Inspections* (see Appendix J). Quarterly visual assessment at substantially identical outfalls will occur on a quarterly basis at least once in each of the following 2-month intervals on a rotating basis for the permit term:

April 1 – May 31;
June 30 – July 31;
August 1 – September 30; and

October 1 – November 30.

Visual assessments must be made:

Of a sample in a clean, colorless glass or plastic container, and examined in a well-lit area;
On samples collected in the first 30 minutes of a discharge from a storm event. If it is not possible to collect the samples within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and you must document why it was not possible to take the sample within the first 30 minutes. In the case of snowmelt, samples must be taken during a period with in a measurable discharge from your site; and
For storm events, on discharges that occur at least 72 hours (three days) from the previous discharge. The 72-hour (three days) storm interval does not apply if you document that less than a 72-hour (three days) interval is representative for local storm events during the sampling period.

Outfalls to be inspected are identified on the site map. Most of the outfalls at the facility are substantially identical outfalls (SIO), therefore quarterly visual assessment of the discharge at one SIO can also apply to the other SIO.

The visual assessment will inspect for the following water quality characteristics: color, odor, clarity, floating solids, settled solids, suspended solids foam, oil sheen, and other obvious indicators of storm water pollution.

The SWPP Team member performing the visual assessment will document potential stormwater pollution problems that were observed during the assessment on the Quarterly Visual Assessment form. Any required corrective actions identified during the assessment will be addressed in accordance with Section 5.4 Corrective Actions Process of this plan.

5.3 Corrective Action

Upon discovery of any of the following conditions, the condition must be documented within 24 hours of the discovery on the form provided in Appendix E of this SWPPP:

An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this or another NPDES permit to a water of the U.S.) occurs at your facility;
A discharge violates a numeric effluent limit listed in Table 2-1 and in your Part 8 sector-specific requirements;
Your control measures are not stringent enough for the discharge to meet applicable water quality standards or the non-numeric effluent limits in this permit;
A required control measure was never installed, was installed incorrectly, or not in accordance with Parts 2 and/or 8, or is not being properly operated or maintained;
Whenever a visual assessment shows evidence of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam).
Within 14 days of discovery of the identified condition, corrective action(s) to eliminate or further investigate the condition or documentation that no corrective action is needed will be documented and entered into the LANL MSGP Corrective Actions Database by the Deployed ENV Professional This is required to track the status of all issues.

If it is determined that corrective actions are necessary, the facility must immediately take all reasonable steps necessary to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events. Also if any corrective actions are identified the SWPPP must be reviewed and a determination made as to whether to modify it. If any modifications to control measures are needed these will be made before the next storm event if possible, or as soon as practicable following that storm event. If a runoff event should occur while a control measure is off line, EM&R will be contacted. A DEP will evaluate control measures informally to ensure all control measures are maintained.

5.4 Conditions Requiring Review to Determine if Modifications Are Necessary

If any of the following conditions occur, a review of the selection, design, installation, and implementation of control measures will be performed to determine if modifications are necessary to meet the effluent limits in this permit:

construction or a change in design, operation, or maintenance at your facility that significantly changes the nature of pollutants discharged in stormwater from the facility, or significantly increases the quantity of pollutants discharged; or

the average of four quarterly sampling results exceeds an applicable benchmark. If less than four benchmark samples have been taken, but the results are such that an exceedance of the four quarter average is mathematically certain (i.e., if the sum of quarterly sample results to date is more than four times the benchmark level) this is considered a benchmark exceedance, triggering this review.

If a review identifies any necessary modifications, they will be performed following the corrective action process identified in Section 5.4 above.

SECTION 6: DOCUMENTATION TO SUPPORT ELIGIBILITY CONSIDERATIONS UNDER OTHER FEDERAL LAWS

6.1 Documentation Regarding Endangered Species.

The Los Alamos National Laboratory (LANL) Threatened and Endangered Species Habitat Management Plan (HMP) (see Appendix J)was prepared to provide for the protection of federally listed threatened and endangered species and their habitats at LANL. The HMP was designed to be a comprehensive landscape-scale management plan that balances the current operations and future development needs of LANL with the habitat requirements of threatened and endangered species. It also facilitates DOE compliance with the Endangered Species Act and related federal regulations. The HMP received concurrence from the U.S. Fish and Wildlife Service (USFWS) (see Appendix J) and was first implemented in 1999. All changes to the HMP, such as adding new species or changing requirements, are assessed in a new consultation with the USFWS before being implemented. The HMP provides guidance by species for different types of activities allowed without further review by the USFWS.

Currently, the only federally-listed species that have habitat or occur at LANL are the Southwestern Willow Flycatcher (Empidonax trailii extimus), Jemez Mountains Salamander (Plethodon neomexicanus), and Mexican Spotted Owl (Strix occidentalis lucida). Suitable habitats for these species, along with a protective buffer area surrounding the habitats, have been designated as Areas of Environmental Interests (AEIs). An AEI consists of a core area that contains important breeding or wintering habitat for a specific species and a buffer area around the core area. The buffer protects the core area from disturbances that would degrade the value of the core area to the species.

The HMP includes ecorisk analyses which account for any industrial facility’s storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities. In addition, the Site-wide Environmental Impact Statement (SWEIS) biological assessment (BA) covered the continuation of Laboratory operations and included outfalls.

As determined by earlier evaluations, storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities from LANL MSGP locations are not likely to adversely affect any species that is federally-listed as endangered or threatened under Criterion D Section iii, the ESA, and will not result in the adverse modification or destruction of habitat that is federally-designated as "critical habitat" under the ESA. New activities are evaluated to determine if they will have an impact to any species. If an activity can be completed within the guidelines of the HMP it can go forward as scheduled; however, if the activity can not comply with the guidelines, the HMP requires that a project-specific BA be prepared for the action and go through the consultation process with the USFWS.

Documentation Regarding Historic Properties

In August, 2015 and December 2008, the Cultural Resources Team (using GPS spatial data as well as conducting visual inspections), reviewed the Laboratory industrial sites (see list below) and their associated outfalls and monitoring stations subject to the 2015 Multi-Sector General Permit (Permit #NMR050000) for effects on historic properties. All of these sites were found to be undertakings of no effect and in compliance with Section 106 of the National Historic Preservation Act (i.e., Criterion B).

TA-3-22 Power and Steam Plant
TA-3-38 Metals Fabrication Shop
TA-3-38 Wood Shop
TA-3-39 and 102 Metal Shop
TA-3-66 Sigma Complex
TA-60 Asphalt Batch Plant
TA-60-1 Heavy Equipment Yard
TA-60 Material Recycle Facility
TA-60 Roads and Grounds
TA-60-2 Warehouse
TA-54 Area L
TA-54 Area G
TA-54 Maintenance Facility West
TA-54 RANT

6.3 Documentation Regarding NEPA Review

The Final Site-Wide Environmental Impact Statement for the Operation of Los Alamos National Laboratory (DOE/EIS-0380) was issued in May 2008, and a Record of Decision in September 2008. Storm water issues and associated pollution prevention requirements and activities at LANL are analyzed in Chapters 4 and 5 of the 2008 Site-Wide EIS. These activities are integrated into environmental reviews on a project-specific level through both the LANL excavation permit process and the LANL project requirements (PR-ID) process. Storm water issues are identified and pollution prevention activities are implemented during the design and construction phases of all LANL projects, and as part of facility operations, including routine maintenance. LANL staff monitors storm water pollution prevention compliance at the MSGP sites in accordance with Section 4.0 Monitoring of this plan. Corrective actions are taken as necessary as described in Section 5.4 Corrective Actions Process of this plan.

SECTION 7: SWPPP CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Cliff Kirkland

Title: Science & Technology Operations Facility Operations Director

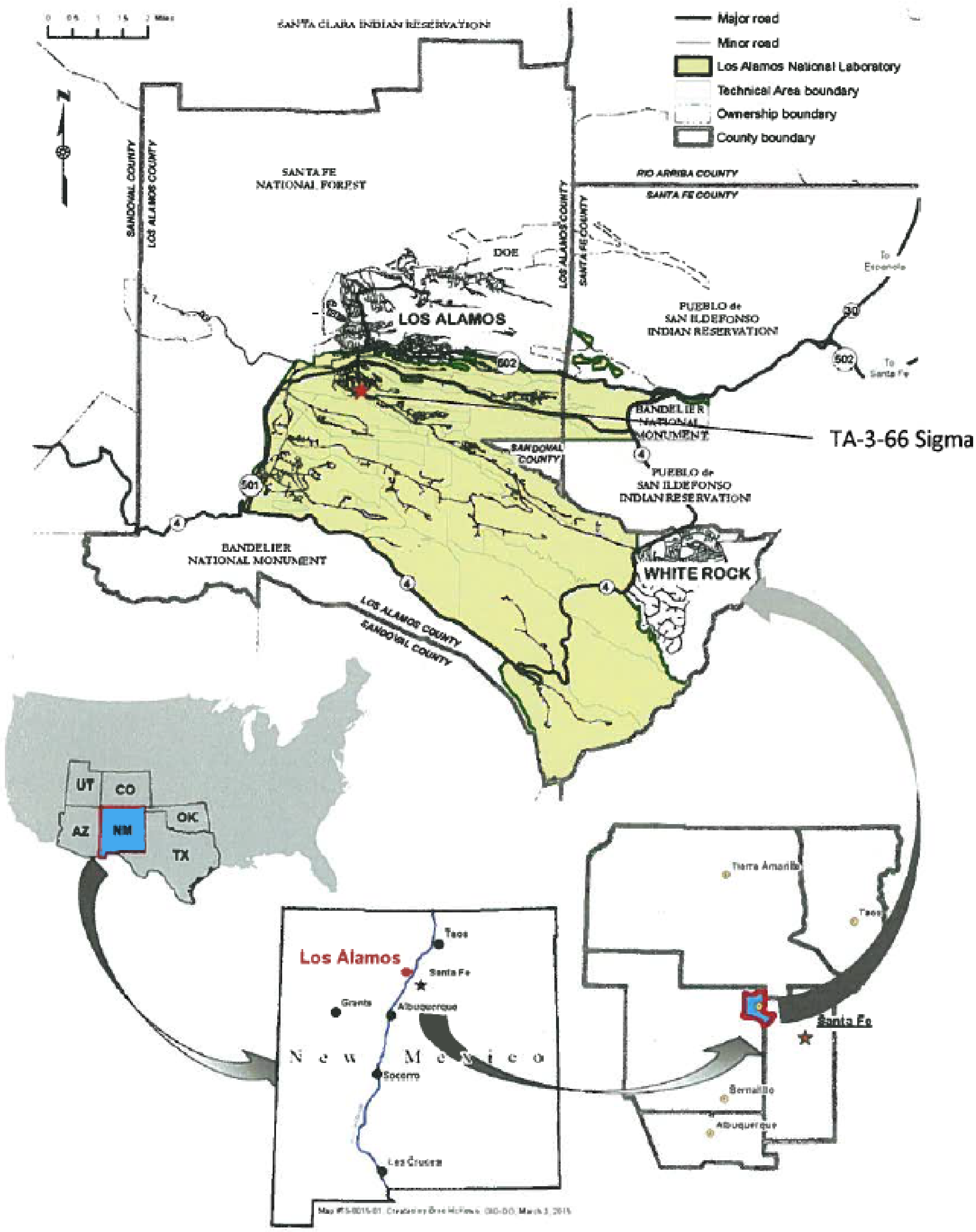
Signature:

Date: 8/28/15

SECTION 8: SWPPP MODIFICATIONS

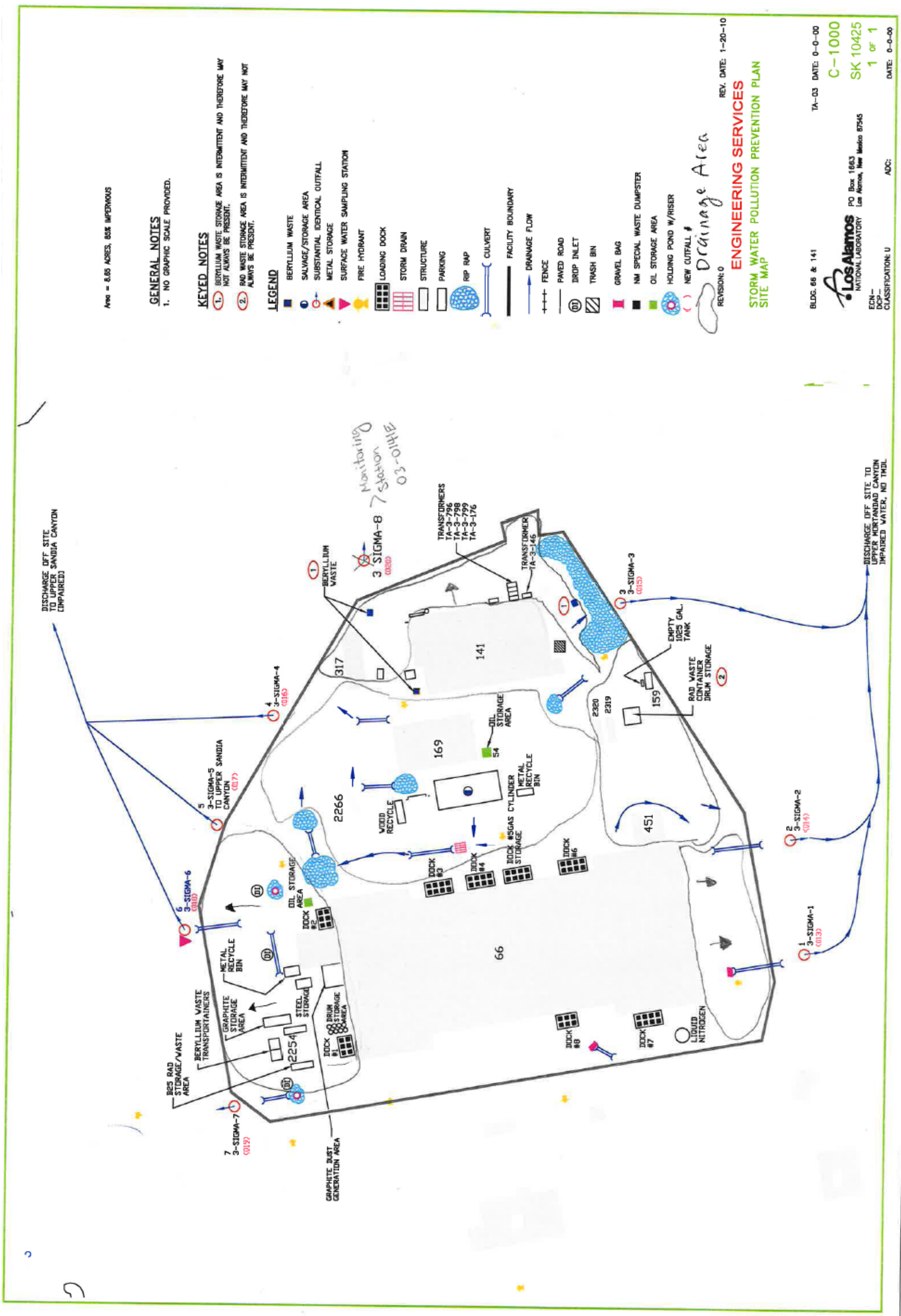
Modification of this SWPPP will occur whenever necessary to address any of the triggering conditions for corrective action in Part 5.4.1 of this plan and to ensure that they do not reoccur, or to reflect changes implemented when a review following the triggering conditions in Part 5.4.2 indicates that changes to control measures are necessary to meet the effluent limits in this permit. Changes to this SWPPP document must be made in accordance with the corrective action deadlines in Parts 5.4.3 and 5.4.4, and must be signed and dated in accordance with MSGP Appendix B, Subsection 11 (A, B, or C). A copy of the MSGP can be found at http://water.epa.gov/polwaste/npdes/stormwater/upload/msgp2015_finalpermit.pdf.

Appendix A – General Location Map

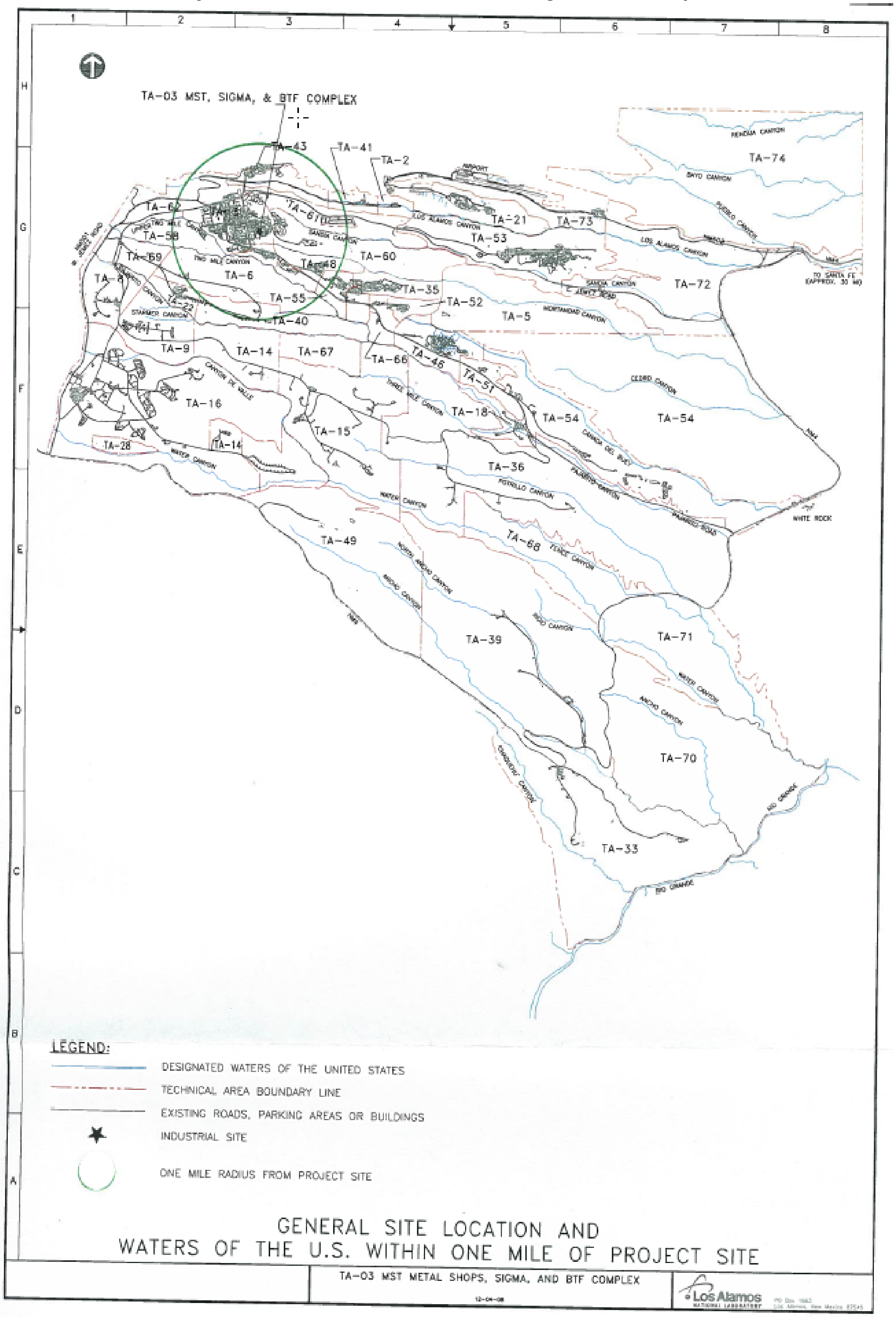


Appendix B – Site Map, Location of Nearby Surface Waters and Receiving Waters Map, Threatened and Endangered Species Map

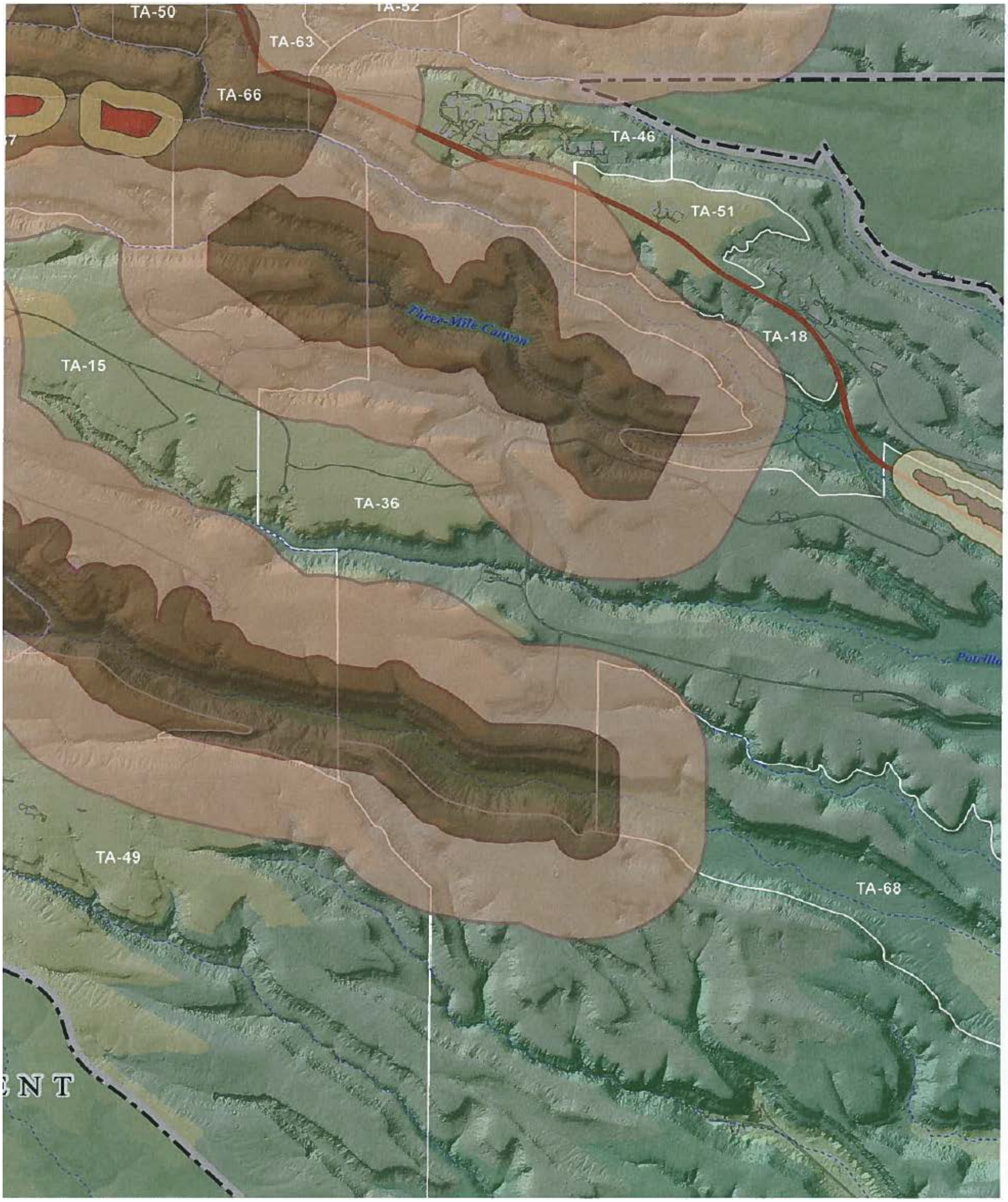
Site Map



Location of Nearby Surface Waters and Receiving Waters Map



Endangered Species Map



Appendix C – Spill Occurrence Log

Spill Log – Record of Spills, Leaks and Other Releases

Spill Log

Table for Tracking Past and Future Spills

Date	Spill Location	What Spilled	Quantity Spilled	Corrective Action Taken	Plans to Prevent Recurrence

Appendix D – Inspection Records

Facility Inspections

Inspection Forms and Completed Reports:

Quarterly Routine Inspections
Quarterly Visual Assessments
Annual (Comprehensive Site Inspection)

Los Alamos National Laboratory
ENV-RCRA

NPDES Multi-Sector General Permit Routine Inspection Form
(rev. 03/2009) Page 1 of __ (use additional sheets if necessary)

Name of Facility:	**Responsible FOD (Name & Organization):**
Qualified Inspector(s): **Others Present:**	**Inspection type:** ☐ **Quarterly** ☐ **Other** — **Date of inspection (MM/DD/YYYY):** **Time of inspection:**

Weather: ☐ **Clear** ☐**Cloudy** ☐ **Rain** ☐ **Sleet** ☐ **Fog** ☐ **Snow** ☐ **High Winds** ☐ **Other:**
Temperature: **° F** **Is Inspection Being Conducted During a Storm Water Discharge?** ☐**Yes** ☐**No**

#	Structural Control Measures (BMP)s	Location	Operating Effectively (Yes or No)?	If No, Need to Maintain (M), Repair (R) or Replace (RP)?	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12					

Were additional BMPs or Control Measures implemented? ☐ **Yes** ☐ **No Describe:**

Were previously identified conditions corrected before the next anticipated storm event? ☐ **Yes** ☐ **No If No, describe reason:**

Area/Activity (Areas of Industrial Materials or Activities Exposed to Storm Water)	Inspected?	Controls Adequate?	**Corrective Action Needed and Notes (List area letter with comments below)**
A. Material loading/unloading & storage areas			
B. Equipment operations & maintenance areas			
C. Fueling Areas			
D. Outdoor vehicle & equipment washing areas			
E. Waste Handling & disposal areas			
F. Erodible areas / construction			
G. Non-storm water / illicit connections			
H. Salt storage piles or pile containing salt			
I. Dust generation & vehicle tracking			

Are the SWPP Plan maintenance, schedules and procedures being implemented at the facility? ☐ **Yes** ☐ **No**

Were any Corrective Actions initiated or completed? ☐ **Yes** ☐ **No Describe:**

Are there any conditions requiring Corrective Action? ☐ **Yes** ☐ **No If Yes, List Number of Corrective Actions Required _____**
(Note – need a Corrective Action Form for each listed)

Los Alamos National Laboratory
ENV-RCRA

NPDES Multi-Sector General Permit Inspection Form
(rev. 03/2009) Certification Sheet

Non-Compliance

Describe any incidents of non-compliance and/or need for corrective action observed and not described above:

Additional Control Measures

Describe any additional control measures needed to comply with the permit requirements:

Notes

Use this space for any additional notes or observations from the inspection:

Inspector's Signature and date:______________________________

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: ______________________________

Signature:______________________________**Date:**_______________

MSGP Quarterly Visual Assessment Form

Complete a separate form for each outfall you assess. When adverse weather conditions prevent the collection of a sample during the quarter, a substitute sample must be taken during the next qualifying storm event. Maintain this document in your SWPPP).

Name/Location of Facility:	Permit Number: NMR05GB21	Inspection Quarter: ☐ Apr-May ☐ Jun-July ☐ Aug-Sep ☐ Oct-Nov
Outfall ID:	"Substantially Identical Outfall"? ☐ Yes ☐ No	If **YES** identify other Outfalls in the Group:

Person(s) collecting sample (PRINT): Signature:
PPT Member? ☐ Yes ☐ No

Person(s) examining sample (PRINT): Signature:
PPT Member? ☐ Yes ☐ No

Date & Time Discharge Began:	Date & Time Sample Collected:	Date & Time Sample Examined:
Substitute Sample? ☐ Yes ☐ No	**If YES**, identify quarter/year when sample was originally scheduled to be collected:	

Was the sample collected in the first 30 minutes? ☐ Yes ☐ No If No, explain why not

Nature of Discharge: ☐ Rainfall. Amount ______ inches ☐ Snowmelt. Amount ______ inches

Previous Storm Ended > 72 hours Before Start of This Storm? ☐ Yes ☐ No — **If No**, Explain: *

PARAMETERS

Color ☐ None ☐ Other	**If Other** describe:
Odor ☐ None ☐ Musty ☐ Sewage ☐ Sulfur ☐ Sour ☐ Solvents ☐ Petroleum/Gas ☐ Other	**If Other**, describe the odor:
Clarity: ☐ Clear ☐ Slightly Cloudy ☐ Cloudy ☐ Opaque ☐ **Other (describe):**	
Floating Solids: ☐ Yes ☐ No	**If YES**, describe if raw or waste materials(s):
Settled Solids: ** ☐ Yes ☐ No	**If YES**, are solids Fine ☐ Coarse ☐ If Other describe:
Suspended Solids: ☐ Yes ☐ No	**If YES**, are solids Fine ☐ Coarse ☐ If Other describe:
Foam (gently shake sample): ☐ Yes ☐ No	**If YES**, on the surface ☐ or ☐ in the water. Describe color:
Oil Sheen ☐ Yes ☐ No ☐ **Color of Sheen:**	**Thickness:** Flecks ☐ Globs ☐ Describe if other:
Other Obvious Indicators of Pollution Present in the sample? Yes ☐ No ☐	If YES describe:

SITE OBSERVATIONS

Potential pollutants found during visual examination? ☐ Yes ☐ No **If Yes**, list pollutant(s) and if possible indicate the source: If source is identified during collection of sample, please notify Tim Zimmerly @ 699-7621 or 664-0105

Pollutant	Source	Pollutant	Source

NOTE: A clean up of the site should be conducted if the pollutant source is known. Was proper Notification made? ☐ Yes ☐ No
If Yes, indicate who was notified:

CORRECTIVE ACTION

If storm water contamination was identified in this sample through visual assessment, was a Corrective Action Form filled out within 24 hrs of observation? Yes ☐ No ☐ **If No**, explain why not:

Was a Corrective Action Plan identified within 14 days of the observation? Yes ☐ No ☐ **If No**, explain why not:

Other Relevant Information: Yes ☐ No ☐
Use the back of this form to list any concerns, comments, and/or descriptions of pictures taken, (attach additional sheets as necessary).

* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.

** Observe for settled solids after allowing the sample to sit for approximately one-half hour.

Appendix E – Quarterly Visual Assessment Records and Discharge Monitoring Reports (Maintained on LANL site premises)

Appendix F – Corrective Action Log

(Maintained on LANL site premises)

Appendix G – 2015 MSGP

(Maintained on LANL site premises)

Appendix H– SWPP Plan Modifications Log

SWPPP Amendment Log

SWPPP Amendment Log

Date of Amendment	Plan Section	Reason for Amendment	Amendment	PE Certification needed?

Appendix I – Storm Water Monitoring Data, Discharge Monitoring Reports, Visual Sampling Events and Results, and Non-Storm Water Discharge Assessment and Certification

(Storm Water Monitoring Data, Discharge Monitoring Reports, Visual Sampling Events and Results Maintained on LANL site premises)

Non Storm water Discharge Certification

NON-STORMWATER DISCHARGE

ASSESSMENT AND CERTIFICATION

Sigma TA-3-66 Facility

Completed by: Marc R. Gallegos
Title: Deployed EW Professional
Date: 8/25/15

Date of Evaluation	Outfall Directly Observed During the Test (Location)	Identify Potential Significant Sources of Non- Stormwater	Method Used to Test or Evaluate Discharge	Is Non-Storm Water Present?	How Often?	Describe Results from Test for the Presence of Non-Storm Water Discharge
8/25/15	All	None	Walk down of facility	No	N/A	New 2015 MSGP Permit

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and completed. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name & Official Title: DSESH-STO ESH MANAGER

Signature: Date Signed: 8-26-15

Appendix J-Referenced Documents

(Included at end of document)

ENV-CP-QP-045, Installing, Setting Up, and Operating ISCO Samplers for the MSGP

ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program

ENV-CP-QP-047, Inspecting Storm Water Runoff Samplers and Retrieving Samples

ENV-CP-QP-048, Processing MSGP Storm Water Samples

ENV-CP-QP-007, Spill Investigation

P 322-3, Performance Improvement from Abnormal Events

PRO-0493-STO-HAZMAT, Hazardous materials Spills Response Emergency Action Procedure

STO-OP-043, Sec. 6.18, STO Generator Waste Operations

P 101-14, Chemical Management

Appendix K-Monitoring Data

TA-03-0039

Location Group Name	Location Record No.	Location ID	Date Sampled	Sample Record No.	Field Sample ID
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	05/14/2010	162806	WTMSGP-10-14757
MSGP	23992	03-0039E	06/24/2010	162807	WTMSGP-10-14758
MSGP	23992	03-0039E	06/24/2010	162807	WTMSGP-10-14758
MSGP	23992	03-0039E	06/24/2010	162807	WTMSGP-10-14758
MSGP	23992	03-0039E	06/24/2010	162807	WTMSGP-10-14758
MSGP	23992	03-0039E	08/04/2010	162808	WTMSGP-10-14759
MSGP	23992	03-0039E	08/04/2010	162808	WTMSGP-10-14759
MSGP	23992	03-0039E	08/04/2010	162808	WTMSGP-10-14759
MSGP	23992	03-0039E	08/04/2010	162808	WTMSGP-10-14759
MSGP	23992	03-0039E	10/01/2010	162809	WTMSGP-10-14760
MSGP	23992	03-0039E	10/01/2010	162809	WTMSGP-10-14760
MSGP	23992	03-0039E	10/01/2010	162809	WTMSGP-10-14760
MSGP	23992	03-0039E	10/01/2010	162809	WTMSGP-10-14760
MSGP	23992	03-0039E	07/21/2011	162908	WTMSGP-11-6408
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	07/21/2011	162931	WTMSGP-11-6432
MSGP	23992	03-0039E	08/10/2011	162909	WTMSGP-11-6409
MSGP	23992	03-0039E	08/10/2011	162909	WTMSGP-11-6409
MSGP	23992	03-0039E	08/19/2011	162910	WTMSGP-11-6410
MSGP	23992	03-0039E	08/19/2011	162910	WTMSGP-11-6410
MSGP	23992	03-0039E	10/04/2011	162911	WTMSGP-11-6411
MSGP	23992	03-0039E	10/04/2011	162911	WTMSGP-11-6411

MSGP	23992	03-0039E	05/08/2012	231943	WTMSGP-12-12955
MSGP	23992	03-0039E	07/02/2012	232622	WTMSGP-12-13382
MSGP	23992	03-0039E	08/02/2012	245129	WTMSGP-12-13383
MSGP	23992	03-0039E	10/12/2012	246587	WTMSGP-12-13384
MSGP	26928	03-0141E	04/04/2012	231659	WTMSGP-12-12960

Parameter Group Name	Parameter Code	Parameter Name	FSR Record No.	Report Result
METALS	Zn	Zinc	8561895	867
WATERPMRRAD	Ra-228	Radium-228	8561761	0.983
METALS	Se	Selenium	8562563	1
GEN_CHEM	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	8561584	0.159
WATERPMRRAD	Ra-226	Radium-226	8562561	0.501
METALS	Fe	Iron	8561580	4070
WATERPMRRAD	GROSSA	Gross alpha	8562766	51
METALS	Al	Aluminum	8561887	2840
METALS	Al	Aluminum	8713543	57200
METALS	Fe	Iron	8713031	87200
GEN_CHEM	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	8713032	0.05
METALS	Zn	Zinc	8713544	11800
METALS	Zn	Zinc	8852175	1560
GEN_CHEM	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	8852181	0.05
METALS	Fe	Iron	8852187	9560
METALS	Al	Aluminum	8852172	4520
METALS	Al	Aluminum	9139860	7290
METALS	Fe	Iron	9139389	8330
GEN_CHEM	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	9139390	0.063
METALS	Zn	Zinc	9139861	1130
METALS	Al	Aluminum	9834132	1570
PCB	37324-23-5	Aroclor-1262	9833754	0.037
PCB	53469-21-9	Aroclor-1242	9833776	0.037
PCB	12674-11-2	Aroclor-1016	9833753	0.037
PCB	12672-29-6	Aroclor-1248	9833777	0.037
PCB	11104-28-2	Aroclor-1221	9833774	0.037
PCB	11141-16-5	Aroclor-1232	9833775	0.037
PCB	11096-82-5	Aroclor-1260	9833783	0.037
PCB	11097-69-1	Aroclor-1254	9833778	0.037
METALS	Al	Aluminum	9882312	2680
METALS	Zn	Zinc	9882311	127
METALS	Zn	Zinc	9915992	133
METALS	Al	Aluminum	9915991	3310
METALS	Al	Aluminum	10053311	420
METALS	Zn	Zinc	10053312	69.9
METALS	Zn	Zinc	10420569	567
METALS	Zn	Zinc	10692790	288
METALS	Zn	Zinc	10708689	86
METALS	Zn	Zinc	10824535	83.8
METALS	Zn	Zinc	10407148	11.8

Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type	Chain Of Custody No.	Best Value Flag	Date La Modifie
	Y	W	REG	WT	10-3218	Y	06/25/20
	N	W	REG	WT	10-3218	Y	06/25/20
U	N	W	REG	WT	10-3218	Y	06/25/20
J	Y	W	REG	WT	10-3218	Y	06/25/20
	Y	W	REG	WT	10-3218	Y	06/25/20
N	Y	W	REG	WT	10-3218	Y	06/25/20
	Y	W	REG	WT	10-3218	Y	06/25/20
N	Y	W	REG	WT	10-3218	Y	06/25/20
	Y	W	REG	WT	10-3551	Y	08/19/20
	Y	W	REG	WT	10-3551	Y	08/19/20
U	N	W	REG	WT	10-3551	Y	08/19/20
	Y	W	REG	WT	10-3551	Y	08/19/20
	Y	W	REG	WT	10-4144	Y	09/30/20
U	N	W	REG	WT	10-4144	Y	09/30/20
E	Y	W	REG	WT	10-4144	Y	09/30/20
E	Y	W	REG	WT	10-4144	Y	09/30/20
N*	Y	W	REG	WT	11-121	Y	12/15/20
*	Y	W	REG	WT	11-121	Y	12/15/20
J	Y	W	REG	WT	11-121	Y	12/15/20
	Y	W	REG	WT	11-121	Y	12/15/20
	Y	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
U	N	W	REG	WT	11-2954	Y	09/12/20
N*	Y	W	REG	WT	11-3211	Y	09/29/20
	Y	W	REG	WT	11-3211	Y	09/29/20
	Y	W	REG	WT	11-3311	Y	10/11/20
	Y	W	REG	WT	11-3311	Y	10/11/20
EN	Y	W	REG	WT	12-41	Y	11/22/20
	Y	W	REG	WT	12-41	Y	11/22/20
	Y	W	REG	WT	2012-2027	Y	06/08/20
	Y	W	REG	WT	2012-2070	Y	08/16/20
	Y	W	REG	WT	2012-2164	Y	09/06/20
	Y	W	REG	WT	2013-199	Y	11/20/20
	Y	W	REG	WM	2012-2016	Y	05/11/20

TA-03-0141

Location Group Name	Location Record No.	Location ID	Date Sampled	Sample Record No.	Field Sample ID	Field Prep Code
MSGP	26928	03-0141E	04/04/2012	231659	WTMSGP-12-12960	UF
MSGP	26928	03-0141E	04/04/2012	231659	WTMSGP-12-12960	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231660	WTMSGP-12-12954	UF
MSGP	26928	03-0141E	04/04/2012	231659	WTMSGP-12-12960	UF
MSGP	26928	03-0141E	07/07/2012	232623	WTMSGP-12-12971	UF
MSGP	26928	03-0141E	07/07/2012	232623	WTMSGP-12-12971	UF
MSGP	26928	03-0141E	08/02/2012	245130	WTMSGP-12-12976	UF
MSGP	26928	03-0141E	08/02/2012	245130	WTMSGP-12-12976	UF
MSGP	26928	03-0141E	10/12/2012	246282	WTMSGP-12-12987	UF
MSGP	26928	03-0141E	10/12/2012	246282	WTMSGP-12-12987	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	06/14/2013	329813	WTMSGP-13-29843	UF
MSGP	26928	03-0141E	05/15/2015	360305	MSGP-15-95636	F

Parameter Group Name	Parameter Code	Parameter Name	FSR Record No.
METALS	Hg	Mercury	10407147
METALS	Al	Aluminum	10407145
PCB	12674-11-2	Aroclor-1016	10422220
PCB	37324-23-5	Aroclor-1262	10422227
PCB	53469-21-9	Aroclor-1242	10422223
PCB	11097-69-1	Aroclor-1254	10422225
PCB	11096-82-5	Aroclor-1260	10422226
PCB	11104-28-2	Aroclor-1221	10422221

PCB	11141-16-5	Aroclor-1232	10422222
PCB	12672-29-6	Aroclor-1248	10422224
WATERPMRRAD	GROSSA	Gross alpha	10422219
METALS	Cu	Copper	10407146
METALS	Cu	Copper	10692791
METALS	Zn	Zinc	10692792
METALS	Zn	Zinc	10708691
METALS	Cu	Copper	10708690
METALS	Cu	Copper	10809784
METALS	Zn	Zinc	10809785
PCB	12672-29-6	Aroclor-1248	11200370
PCB	11104-28-2	Aroclor-1221	11200367
PCB	11141-16-5	Aroclor-1232	11200368
PCB	11096-82-5	Aroclor-1260	11200372
PCB	11097-69-1	Aroclor-1254	11200371
PCB	37324-23-5	Aroclor-1262	11200373
PCB	53469-21-9	Aroclor-1242	11200369
PCB	12674-11-2	Aroclor-1016	11200366
METALS	Tl	Thallium	11961488

Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose	Sample Type	Chain Of Custody No.	Best Value Flag
0.2	ug/L	U	N	W	REG	WM	2012-2016	Y
822	ug/L		Y	W	REG	WM	2012-2016	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.0748	ug/L	J	Y	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
0.105	ug/L	U	N	W	REG	WM	2012-2014	Y
1.9	pCi/L	U	N	W	REG	WM	2012-2014	Y
2.71	ug/L	*	Y	W	REG	WM	2012-2016	Y
8.59	ug/L		Y	W	REG	WT	2012-2070	Y
47.2	ug/L		Y	W	REG	WT	2012-2070	Y
44.7	ug/L		Y	W	REG	WT	2012-2164	Y
7.51	ug/L		Y	W	REG	WT	2012-2164	Y
9.71	ug/L		Y	W	REG	WT	2013-89	Y
49.2	ug/L		Y	W	REG	WT	2013-89	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y

0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.114	ug/L	U	N	W	REG	WT	2013-1010	Y
0.45	ug/L	U	N	W	REG	WT	2015-1220	Y

Date Last Modified	Date Uploaded	Date Validated	Sampling Plan ID	ULI	URI	USI
05/11/2012	05/11/2012	05/09/2012	3841			
05/11/2012	05/11/2012	05/09/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
06/08/2012	06/08/2012	06/08/2012	3841			
05/11/2012	05/11/2012	05/09/2012	3841			
08/16/2012	08/16/2012	08/16/2012	3841			
08/16/2012	08/16/2012	08/16/2012	3841			
09/06/2012	09/06/2012	09/06/2012	3841			
09/06/2012	09/06/2012	09/06/2012	3841			
11/14/2012	11/14/2012	11/14/2012	3841			
11/14/2012	11/14/2012	11/14/2012	3841			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
07/22/2013	07/22/2013	07/22/2013	4179			
06/17/2015	06/17/2015	06/17/2015	9185			

Date Validated	Sampling Plan ID	ULI	URI	USI
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
06/25/2010	2703		3.07E+08	10094418
08/19/2010	2703		3.07E+08	10094419
08/19/2010	2703		3.07E+08	10094419
08/19/2010	2703		3.07E+08	10094419
08/19/2010	2703		3.07E+08	10094419
09/30/2010	2703		3.07E+08	10094420
09/30/2010	2703		3.07E+08	10094420
09/30/2010	2703		3.07E+08	10094420
09/30/2010	2703		3.07E+08	10094420
12/15/2010	2703		3.08E+08	10094421
12/15/2010	2703		3.08E+08	10094421
12/15/2010	2703		3.08E+08	10094421
12/15/2010	2703		3.08E+08	10094421
09/12/2011	3410		3.08E+08	10116881
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/12/2011	3410		3.08E+08	10116918
09/29/2011	3410		3.08E+08	10116882
09/29/2011	3410		3.08E+08	10116882
10/11/2011	3410		3.08E+08	10116883
10/11/2011	3410		3.08E+08	10116883
11/22/2011	3410		3.09E+08	10116884
11/22/2011	3410		3.09E+08	10116884
06/07/2012	3841			
08/16/2012	3841			
09/06/2012	3841			
11/20/2012	3841			
05/09/2012	3841			

Sandia Tributary below Sigma

Location Group Name	Location Record No.	Location ID	Date Sampled	Sample Record No.
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/05/2009	91717
MSGP	17561	Sandia Tributary below Sigma	07/21/2009	91718
MSGP	17561	Sandia Tributary below Sigma	07/21/2009	91718
MSGP	17561	Sandia Tributary below Sigma	08/16/2009	91733
MSGP	17561	Sandia Tributary below Sigma	08/16/2009	91733
MSGP	17561	Sandia Tributary below Sigma	08/30/2009	91749
MSGP	17561	Sandia Tributary below Sigma	08/30/2009	91749
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	05/14/2010	162841
MSGP	17561	Sandia Tributary below Sigma	07/09/2010	162842
MSGP	17561	Sandia Tributary below Sigma	07/09/2010	162842
MSGP	17561	Sandia Tributary below Sigma	08/04/2010	162843
MSGP	17561	Sandia Tributary below Sigma	08/04/2010	162843
MSGP	17561	Sandia Tributary below Sigma	10/20/2010	162844
MSGP	17561	Sandia Tributary below Sigma	10/20/2010	162844
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637

MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	17561	Sandia Tributary below Sigma	07/02/2013	330637
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	09/16/2009	91762
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/21/2009	91763
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/21/2009	91763
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/21/2009	91763
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/21/2009	91763
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	05/14/2010	162791
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	05/14/2010	162791
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	05/14/2010	162791
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	05/14/2010	162791
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162792
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162792
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162792
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/02/2010	162853
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/20/2010	162793
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/20/2010	162793
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/20/2010	162793
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	10/20/2010	162793
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/21/2011	162901
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162863
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162863
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930

MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	07/28/2011	162930
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	08/13/2011	162902
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	08/13/2011	162902
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	08/19/2011	162903
MSGP	27322	TA3 Metal Shop 03-0034 Sect AA	08/19/2011	162903

Field Sample ID	Field Prep Code	Parameter Group Name	Parameter Code
GU09070E122301	UF	METALS	Cu
GU09070E122301	UF	WATERPMRRAD	GROSSA
GU09070E122301	UF	METALS	Hg
GU09070E122301	UF	METALS	Al
GU09070E122301	UF	PCB	53469-21-9
GU09070E122301	UF	PCB	12674-11-2
GU09070E122301	UF	PCB	37324-23-5
GU09070E122301	UF	PCB	11097-69-1
GU09070E122301	UF	PCB	11104-28-2
GU09070E122301	UF	PCB	11096-82-5
GU09070E122301	UF	PCB	11141-16-5
GU09070E122301	UF	PCB	12672-29-6
GU09070E122301	UF	METALS	Zn
GU09070E122302	UF	METALS	Zn
GU09070E122302	UF	METALS	Cu
GU09080E122301	UF	METALS	Cu
GU09080E122301	UF	METALS	Zn
GU09090E122301	UF	METALS	Zn
GU09090E122301	UF	METALS	Cu
WTMSGP-10-14960	UF	METALS	Cu
WTMSGP-10-14960	UF	WATERPMRRAD	GROSSA
WTMSGP-10-14960	UF	PCB	12672-29-6
WTMSGP-10-14960	UF	PCB	11141-16-5
WTMSGP-10-14960	UF	PCB	11096-82-5
WTMSGP-10-14960	UF	PCB	11104-28-2
WTMSGP-10-14960	UF	PCB	11097-69-1
WTMSGP-10-14960	UF	PCB	12674-11-2
WTMSGP-10-14960	UF	PCB	37324-23-5
WTMSGP-10-14960	UF	PCB	53469-21-9
WTMSGP-10-14960	UF	METALS	Al
WTMSGP-10-14960	UF	METALS	Zn
WTMSGP-10-14961	UF	METALS	Zn
WTMSGP-10-14961	UF	METALS	Cu
WTMSGP-10-14962	UF	METALS	Cu

WTMSGP-10-14962	UF	METALS	Zn
WTMSGP-10-14963	UF	METALS	Zn
WTMSGP-10-14963	UF	METALS	Cu
WTMSGP-13-39172	UF	PCB	53469-21-9
WTMSGP-13-39172	UF	PCB	37324-23-5
WTMSGP-13-39172	UF	PCB	12674-11-2
WTMSGP-13-39172	UF	PCB	11097-69-1
WTMSGP-13-39172	UF	PCB	11096-82-5
WTMSGP-13-39172	UF	PCB	11141-16-5
WTMSGP-13-39172	UF	PCB	11104-28-2
WTMSGP-13-39172	UF	PCB	12672-29-6
GU091003-00301	UF	METALS	Al
GU091003-00301	UF	WATERPMRRAD	GROSSA
GU091003-00301	UF	METALS	Fe
GU091003-00301	UF	GEN_CHEM	NO3+NO2-N
GU091003-00301	UF	METALS	Se
GU091003-00301	UF	METALS	Zn
GU091003-00304	UF	METALS	Zn
GU091003-00304	UF	GEN_CHEM	NO3+NO2-N
GU091003-00304	UF	METALS	Fe
GU091003-00304	UF	METALS	Al
WTMSGP-10-14450	UF	METALS	Al
WTMSGP-10-14450	UF	METALS	Fe
WTMSGP-10-14450	UF	METALS	Hg
WTMSGP-10-14450	UF	METALS	Zn
WTMSGP-10-17403	UF	GEN_CHEM	NO3+NO2-N
WTMSGP-10-14451	UF	METALS	Zn
WTMSGP-10-14451	UF	METALS	Fe
WTMSGP-10-14451	UF	METALS	Al
WTMSGP-10-17403	UF	PCB	37324-23-5
WTMSGP-10-17403	UF	PCB	53469-21-9
WTMSGP-10-17403	UF	PCB	12674-11-2
WTMSGP-10-17403	UF	PCB	11096-82-5
WTMSGP-10-17403	UF	PCB	11097-69-1
WTMSGP-10-17403	UF	PCB	11104-28-2
WTMSGP-10-17403	UF	PCB	11141-16-5
WTMSGP-10-17403	UF	PCB	12672-29-6
WTMSGP-10-14452	UF	METALS	Al
WTMSGP-10-14452	UF	METALS	Fe
WTMSGP-10-14452	UF	GEN_CHEM	NO3+NO2-N
WTMSGP-10-14452	UF	METALS	Zn
WTMSGP-11-6400	UF	GEN_CHEM	NO3+NO2-N
WTMSGP-11-24831	UF	METALS	Zn
WTMSGP-11-24831	UF	METALS	Cu

WTMSGP-11-6431	UF	PCB	12674-11-2
WTMSGP-11-6431	UF	PCB	53469-21-9
WTMSGP-11-6431	UF	PCB	37324-23-5
WTMSGP-11-6431	UF	PCB	12672-29-6
WTMSGP-11-6431	UF	PCB	11141-16-5
WTMSGP-11-6431	UF	PCB	11104-28-2
WTMSGP-11-6431	UF	PCB	11097-69-1
WTMSGP-11-6431	UF	PCB	11096-82-5
WTMSGP-11-6401	UF	METALS	Zn
WTMSGP-11-6401	UF	GEN_CHEM	NO3+NO2-N
WTMSGP-11-6402	UF	GEN_CHEM	NO3+NO2-N
WTMSGP-11-6402	UF	METALS	Zn

Parameter Name	FSR Record No.	Report Result	Report Units	Lab Qualifier	Detected	Sample Matrix	Sample Purpose
Copper	1512401	25.6	ug/L		Y	W	REG
Gross alpha	1512396	10.2	pCi/L		Y	W	REG
Mercury	1512393	0.066	ug/L	U	N	W	REG
Aluminum	1512402	2540	ug/L		Y	W	REG
Aroclor-1242	1512397	0.231	ug/L	U	N	W	REG
Aroclor-1016	1512392	0.231	ug/L	U	N	W	REG
Aroclor-1262	1512391	0.231	ug/L	U	N	W	REG
Aroclor-1254	1512394	2.2	ug/L		Y	W	REG
Aroclor-1221	1512399	0.231	ug/L	U	N	W	REG
Aroclor-1260	1512390	2.6	ug/L		Y	W	REG
Aroclor-1232	1512398	0.231	ug/L	U	N	W	REG
Aroclor-1248	1512395	0.231	ug/L	U	N	W	REG
Zinc	1512400	551	ug/L		Y	W	REG
Zinc	1475009	87.8	ug/L		Y	W	REG
Copper	1475010	21.4	ug/L		Y	W	REG
Copper	1475882	44.2	ug/L		Y	W	REG
Zinc	1475881	8000	ug/L		Y	W	REG
Zinc	1477361	235	ug/L		Y	W	REG
Copper	1477362	24.9	ug/L		Y	W	REG
Copper	8561888	22	ug/L		Y	W	REG
Gross alpha	8562767	24.9	pCi/L		Y	W	REG
Aroclor-1248	8561890	0.0354	ug/L	U	N	W	REG
Aroclor-1232	8561893	0.0354	ug/L	U	N	W	REG
Aroclor-1260	8562326	0.095	ug/L	JP	Y	W	REG
Aroclor-1221	8561892	0.0354	ug/L	U	N	W	REG
Aroclor-1254	8561886	0.0354	ug/L	U	N	W	REG
Aroclor-1016	8561581	0.0354	ug/L	U	N	W	REG
Aroclor-1262	8561759	0.0354	ug/L	U	N	W	REG
Aroclor-1242	8562028	0.0354	ug/L	U	N	W	REG

Aluminum	8561884	1780	ug/L	N	Y	W	REG
Zinc	8561889	132	ug/L		Y	W	REG
Zinc	8770396	169	ug/L		Y	W	REG
Copper	8770395	28.2	ug/L		Y	W	REG
Copper	8886636	25.5	ug/L		Y	W	REG
Zinc	8886637	138	ug/L		Y	W	REG
Zinc	9137456	130	ug/L		Y	W	REG
Copper	9137455	14	ug/L		Y	W	REG
Aroclor-1242	11220394	0.1	ug/L	U	N	W	REG
Aroclor-1262	11220398	0.1	ug/L	U	N	W	REG
Aroclor-1016	11220391	0.1	ug/L	U	N	W	REG
Aroclor-1254	11220396	0.1	ug/L	U	N	W	REG
Aroclor-1260	11220397	0.1	ug/L	U	N	W	REG
Aroclor-1232	11220393	0.1	ug/L	U	N	W	REG
Aroclor-1221	11220392	0.1	ug/L	U	N	W	REG
Aroclor-1248	11220395	0.1	ug/L	U	N	W	REG
Aluminum	1478094	599	ug/L		Y	W	REG
Gross alpha	1478095	0.825	pCi/L	U	N	W	REG
Iron	1478092	218	ug/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	1478090	1.68	mg/L	H	Y	W	REG
Selenium	1478091	1	ug/L	U	N	W	REG
Zinc	1478093	180	ug/L		Y	W	REG
Zinc	1513060	261	ug/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	1513062	1.41	mg/L		Y	W	REG
Iron	1513063	152	ug/L		Y	W	REG
Aluminum	1513061	378	ug/L		Y	W	REG
Aluminum	8561891	4640	ug/L	N	Y	W	REG
Iron	8561582	3790	ug/L	N	Y	W	REG
Mercury	8562562	0.09	ug/L	J	N	W	REG
Zinc	8561894	1400	ug/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	9052931	0.99	mg/L		Y	W	REG
Zinc	9053018	1040	ug/L		Y	W	REG
Iron	9052930	1570	ug/L		Y	W	REG
Aluminum	9053019	1470	ug/L		Y	W	REG
Aroclor-1262	9139387	0.0333	ug/L	U	N	W	REG
Aroclor-1242	9139858	0.0333	ug/L	U	N	W	REG
Aroclor-1016	9139388	0.0333	ug/L	U	N	W	REG
Aroclor-1260	9139383	0.0333	ug/L	U	N	W	REG
Aroclor-1254	9139859	0.0333	ug/L	U	N	W	REG
Aroclor-1221	9139856	0.0333	ug/L	U	N	W	REG
Aroclor-1232	9139855	0.0333	ug/L	U	N	W	REG
Aroclor-1248	9139857	0.0333	ug/L	U	N	W	REG
Aluminum	9137452	277	ug/L		Y	W	REG
Iron	9137549	182	ug/L		Y	W	REG

Nitrate-Nitrite as Nitrogen	9137550	1.78	mg/L		Y	W	REG
Zinc	9137453	210	ug/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	9834265	0.688	mg/L		Y	W	REG
Zinc	9841633	893	ug/L		Y	W	REG
Copper	9841665	144	ug/L		Y	W	REG
Aroclor-1016	9841698	0.0354	ug/L	U	N	W	REG
Aroclor-1242	9841666	0.0354	ug/L	U	N	W	REG
Aroclor-1262	9841683	0.0354	ug/L	U	N	W	REG
Aroclor-1248	9841634	0.0354	ug/L	U	N	W	REG
Aroclor-1232	9841664	0.0354	ug/L	U	N	W	REG
Aroclor-1221	9841662	0.0354	ug/L	U	N	W	REG
Aroclor-1254	9841684	0.0354	ug/L	U	N	W	REG
Aroclor-1260	9841731	0.0354	ug/L	U	N	W	REG
Zinc	9891543	598	ug/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	9891522	0.21	mg/L		Y	W	REG
Nitrate-Nitrite as Nitrogen	9913032	0.515	mg/L		Y	W	REG
Zinc	9913079	414	ug/L		Y	W	REG

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ENV-CP-QAPP-MSGP, R5		
Effective Date: 11/04/2013	Next Review Date: 11/04/2015	Los Alamos NATIONAL LABORATORY EST. 1943

Environment, Safety, Health Directorate

Environmental Protection Division – Compliance Programs Group

Quality Assurance Project Plan

Stormwater Multi-Sector General Permit for Industrial Activities Program

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ADESH-OIO, QA Specialist	Signature on File	

Derivative Classifier: ☐ **Unclassified** ☒ **DUSA** **ENVPRO**

Name:	Organization:	Signature:	Date:
Ellena Martinez	ADESH-OIO	Signature on File	

Approval Signatures:

Subject Matter Expert: Holly Wheeler	Organization: ENV-CP	Signature: Signature on File	Date:
Responsible Line Manager: Mike Saladen	Organization: ENV-CP, Team Lead	Signature: Signature on File	Date:
Responsible Line Manager: Anthony Grieggs	Organization: ENV-CP, Group Leader	Signature: Signature on File	Date:

CONTROLLED DOCUMENT

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	06/03	New Document
1	12/05	Annual review and revision
2	07/07	Annual review, incorporated organizational restructure changes.
3	07/09	Biennial Review and Revision
4	07/09	Biennial Review and Revision
5	10/13	Biennial Review and Revision. New format implemented.

Table of Contents

1.0 QUALITY PROGRAM

LANL will comply with the monitoring requirements as specified by the 2008 National Pollutant Discharge Elimination System (NPDES) Stormwater Multi-Sector General Permit for Industrial Activities. Compliance will be demonstrated through the successful implementation of this project plan and applicable procedures.

Los Alamos National Laboratory (the Laboratory) has established a comprehensive stormwater program for its industrial activities. Historically, the Laboratory operated under the NPDES Baseline General Permit and then under the NPDES 1995, 2000, and 2008 Multi-Sector General Permits. The Laboratory submitted its NOI for 2008 coverage in December 2008.

The 2008 MSGP was issued on September 22, 2008 and became effective on September 29, 2008.

The purpose of this project plan is to ensure compliance with the following:

- 2008 NPDES Multi-Sector General Permit (MSGP) and the Clean Water Act (CWA)
- DOE Order 450.1, *Environmental Protection Program*, and DOE Order 5400.5, *Radiation Protection of the Public and Environment*, which establish environmental protection program policies, requirements, and responsibilities

The Environmental Protection, Environmental Compliance Programs (ENV-CP) Water Quality Team has been tasked with overseeing institutional stormwater compliance related activities at the Laboratory.

1.1 QUALITY PROGRAM PURPOSE

This Quality Assurance Project Plan (QAPP) describes the policies and requirements that ensure MSGP activities are conducted in a consistent, agreed-upon manner.

This QA Project Plan describes the policies and requirements that ensure the MSGP processes are conducted in a consistent, agreed-upon manner. Drivers for the quality plan include:

- o DOE Order 414.1C, *Quality Assurance*
- o SD330, *LANL Quality Assurance Program*

This QA Project Plan (QAPP), including implementing procedures, is a sub-tier document to the SD330, *LANL Quality Assurance Program*. The following documents provide requirements to ensure that the MSGP Program is operated in accordance with established plans and procedures:

- SD330, *LANL Quality Assurance Program*
- QA Project Plan for the MSGP (this document)
- Implementing procedures

1.2 ORGANIZATION

ENV-CP is responsible for compliance oversight of the Laboratory’s MSGP coverage. The Group is organized by teams under the line management direction of the Group Leader. Teams are cross-functional and focus on specific Laboratory water quality responsibilities, deliverables, or products. Teams are guided by Team Leaders who have the responsibility to assure the program is completed and properly implemented.

The Team Leader coordinates the project and reports to the ENV-CP Group Leader. The Project Lead implements program oversight, coordinates contractor efforts (if there are any), and reports to the Team Leader. A QA Specialist is assigned to work for the Team Leader to provide quality assurance assistance, advice, and review. In addition, representatives from other groups may participate and contribute to this team as subject matter experts for project activities. The project organization is shown in Attachment 1.

Applicable regulatory drivers include the following:

- Clean Water Act (CWA)
- 2008 NPDES Multi-Sector General Permit (MSGP)
- DOE Order 450.1, *Environmental Protection Program*
- DOE Order 5400.5, *Radiation Protection of Public and Environment*
- P401, *Procedure to Identify, Communicate, and Implement Environmental Requirements*

1.3 RESPONSIBILITIES

The following table lists specific responsibilities:

Who	What
Group Leader	Assure that qualified staff complies with regulatory requirements associated with the MSGP.
Project Lead	Ensure that MSGP-related activities are performed in accordance with the requirements specified in this plan.
ENV-CP Staff	Perform MSGP-related activities as assigned by the Team Leader or Project Leader

2.0 PERSONNEL DEVELOPMENT

Qualified team members will be hired and trained as prescribed in ENV-DO-QP-115, *Personnel Training*. Minimum training requirements for ENV personnel are described in the ENV Division Qualification Standards. The LANL Human Resources Division maintains documentation of education qualification. Required MSGP qualifications and training plans are listed below.

2.1 MSGP CURRICULA

The MSGP Program requires personnel with the following training requirements:

MSGP Inspectors

Curricula 10697 ENV-RCRA MSGP Inspector
Item 43337 ENV-CP-QAPP-MSGP
Item 54892 ENV-RCRA-QP-022 MSGP Stormwater Corrective Actions

Item 42415 ENV-DO-QP-101 *Environmental Reporting Requirements for Releases or Events*
Item 42547 ENV-DO-QP-111 *Reporting Environmental Releases to Pueblo Governments*
Item 40708 ENV-DO-QP-108 *Preparation of External Correspondence for Review and Approval*
Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid

<u>MSGP SWPPP Preparers</u>
Curricula 7814 ENV-RCRA MSGP SWPPP Preparer
Item 43337 ENV-CP-QAPP-MSGP
Item 56593 ENV-RCRA-QP-044 *Preparing Storm Water Discharge Monitoring Reports (MDMRs) for the NPDES Multi-Sector General Permit*
Item 40708 ENV-DO-QP-108 *External Correspondence*
Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 51 ENV-RCRA Design Engineer
Item 44269, COE Review of LANL Produced Design Documents, AP-341-620
Item 44266, COE System Design Descriptions, AP-341-61
Item 44263, COE Engineering Drawings and Sketches, AP-341-608
Item 44261, COE Calculation, AP-341-605
Item 44258, COE Requirements and Criteria Document, AP-341-602
Item 44257, COE Functions & Requirements Document, AP-341-601
Item 43658, CORE Engineering Overview
Item 55428, COE Management Level Determination, AP-341-502
Item 54168, P342 Engineering Standards
Item 47029, COE LANL Review of Design by External Agencies, AP-341-622
Item 43666, Engineering Design Management
Item 43663, Engineering Technical Baseline
Item 44225, COE Evaluation of Vendor Information, AP-341-701

<u>MSGP Visual Assessors</u>

Curricula 10698 ENV-RCRA MSGP Visual Assessor
Item 43337 ENV-RCRA-QAPP-MSGP
Item 50493 ENV-RCRA-QP-064 *MSGP Storm Water Visual Assessments*
Item 42415 ENV-DO-QP-101 *Environmental Reporting Requirements for Releases or Events*
Item 42547 ENV-DO-QP-111 *Reporting Environmental Releases to Pueblo Governments.*
Item 40708 ENV-DO-QP-108 *External Correspondence*

Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid

2.2 MSGP INSPECTOR QUALIFICATIONS

Inspections:

- Post high school education or experience in engineering or environmental science or a related field; or industrial site field experience involving stormwater pollution prevention.
- 2 years experience of completing MSGP inspections or 1 year MSGP inspection experience with the Certified Inspector of Sediment and Erosion Control (CISEC) certification.
- 6 months knowledge of LANL facility operations.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to successfully and effectively evaluate and identify the following at industrial sites:
    - Conditions and activities that could impact stormwater quality at the facility.
    - Inadequate or ineffective BMPs.
    - Required modification or maintenance of existing BMPs.
    - Locations requiring new or additional BMPs.
    - Potential pollutant sources associated with the facility.
    - Appropriate and correct site stabilization measures.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to evaluate the compliance status of each industrial facility and document identified issues during an inspection.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to properly and effectively complete inspection reports, including the ability to perform the following:
    - Prepare reports in a clear, concise manner, identifying site conditions and issues.
    - Write legibly and describe conditions clearly and accurately.
    - Use proper spelling and grammar.
    - Complete the MSGP Routine Inspection Report forms accurately.
    - Accurately enter findings into the Corrective Actions Report database.

- Conduct inspections in a professional manner.
- Be a member of, or contractor supporting, ENV-RCRA or ENV Division.

2.3 MSGP SWPPP PREPARER QUALIFICATIONS

SWPPP Preparation:

One of the 2 criteria below must be satisfied:

- BS degree or experience in engineering, environmental science, or related field, with a background involving stormwater pollution prevention and regulatory compliance relating to MSGP sites and a 1 year minimum of LANL facility operations knowledge and 1 year experience of completing MSGP inspections; or
- Certified Professional in Erosion and Sediment Control (CPESC) or Professional Engineer (PE) with a demonstrated background in stormwater management, sediment and erosion control, and regulatory compliance.

In addition to:

- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to:
    - Prepare SWPPPs per LANL format and in compliance with NPDES MSGP requirements.
    - Identify and specify appropriate BMPs and stabilization measures.
    - Identify potential pollutant sources associated with the facility.
    - Perform necessary calculations to meet regulatory requirements.
    - Prepare a site map.
    - Be a member of, or contractor supporting, ENV-CP or ENV Division.

5.4 MSGP Visual Assessor Qualifications

Quarterly Visual Assessments:

- Education or experience in engineering, environmental science, or a related field; or industrial site field experience involving stormwater pollution prevention; and
- Completed ENV-RCRA training on how to collect and evaluate visual assessment; and
- Demonstrated ability, as determined by the Multi-Sector General Permit Program Lead and/or Water Quality Team Leader, to:
    - Collect quarterly visual samples at the designated outfall.
    - Complete the applicable portions of the MSGP Quarterly Visual Assessment Form.
    - Have working knowledge of the regulatory requirements in Section 4.2 of the MSGP.

5.5 Training Responsibilities

All personnel performing MSGP project-related work are required to obtain appropriate training prior to performing work governed by a procedure. Training for all project personnel will be performed and documented in accordance with ENV-DO-QP-115, *Personnel Training*.

The following table lists specific responsibilities regarding training requirements.

Who	What
Group Leader	Ensure project personnel meet all Laboratory training requirements.
Program Lead	Establish and document job descriptions for each position within the MSGP Project. Ensure all project personnel have the appropriate level of education,

	experience, and training.

3.0 QUALITY IMPROVEMENT

The MSGP Project subscribes to the principles of problem prevention and continuous improvement. The Project Lead is committed to evaluating improvement opportunities identified by trending and reporting.

The Project Lead provides verbal and written updates, as needed, to the Team Leader and Group Leader to keep group management apprised of the focus of the MSGP Project activities and to address any shortcomings that may be identified.

3.1 Corrective Actions within ENV-RCRA

Corrective actions for all ENV-RCRA programs and projects are initiated, tracked, corrected, and documented according to P330-6 *Nonconformance Reporting*, P322-4 *Laboratory Performance Feedback and Improvement Process*, *SD330, Los Alamos National Laboratory Quality Assurance Program*, and Division/Group procedures.

3.3 Quality Improvement Responsibilities

The following table lists specific responsibilities for quality improvement:

Who	**What**
Project Lead	Monitor program performance and ensure issues are corrected in a timely manner.
ENV-CP Staff	Identify opportunities for process improvement, health and safety enhancement, environmental protection, or other improvements of the program's operations. Discuss the identified opportunities with the Project Lead. Ensure issues are reported and corrected in a timely manner.

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The program lead, at least one reviewer, and the Group Leader will approve all revisions to this plan. Revisions to the plan will be provided to the QA Specialist. This plan will be reviewed and revised (if necessary) biennially.

This document will be controlled under the organization's document control system (ENV-DO-QP-106, *Document Control*). Controlled copies of ENV documents are located on the Internet: http://int.lanl.gov/orgs/env/rcra/qa.shtml, all other copies are uncontrolled.

Procedures will be developed as necessary and in accordance with ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*.

Phone calls, email, or fax communications will be documented and controlled if the content provides direction or results in decisions.

4.1 Program Records

The number, type, and detail of all records to be kept will provide sufficient information to allow an individual with equivalent education and training to verify or reconstruct the results. Implementing procedures specify the records, forms, logbook entries, or other information to be kept as documentation of the performance of the procedure.

Records to be kept in the ENV-CP records system include the following:

- Copy of the Multi-Sector General Permit
- Annual Site Compliance Evaluation reports
- Corrective Action Reports
- Reports and certifications required by MSGP
- Records of all data used to complete MSGP Notice of Intent
- Discharge Monitoring Reports

Records to be kept by the Deployed Environmental Professional assigned to the FOD in which the industrial facility resides includes the following:

- Copies of Stormwater Pollution Prevention Plans
- Reports and certifications required by MSGP
- Routine Inspection Forms
- Supporting analytical data reports including Visual Assessment Forms
- Corrective Action Reports
- Discharge Monitoring Reports
    - Annual Site Compliance Evaluation reports

All ENV-CP records will be maintained and available (after the deadline for submittal as given in applicable procedures) for auditing in the records center at ENV-CP (ENV-DO-QP-110, *Records Management*). Records will be archived in compliance with Laboratory and DOE requirements for records retention, storage, and management.

4.2 Program Records Responsibilities

The following table lists specific responsibilities for program records management:

Who	What
Team Leader	Ensure QAPP meets minimum specifications for documentation and records of the SD330, *Los Alamos National Laboratory Quality Assurance Program*
Program Lead	Conduct annual review of records to ensure compliance with project requirements.

4.3 ELECTRONIC MEDIA

The project will utilize electronic means as necessary to maintain data and perform calculations on these data. Electronic means will not however replace paper copies. All records that must be maintained to meet the requirements of the Permit will be kept in hard copy as the official record.

4.4 DATABASES

Analytical data will be maintained in the LANL Water Quality Database (WQDB). Security, verification, and validation of data are maintained in accordance with LANL procedures.

Security -- ENV data will be maintained electronically in a secure manner and will be protected from loss by being maintained as part of an official dataset that is backed up at least weekly.

Verification of data -- All ENV data, either electronic or hardcopy must undergo a verification and validation process that includes the following:

Verification

- Paper deliverables match electronic data that are stored in an official dataset. Paper deliverables include:
  - chain of custody for sample data
  - field log, if applicable, for sample data
  - data packages for analytical data
  - documentation packages for supporting data (e.g., geographic information system)
- All hand-entered data have been verified by a person other than the individual performing the entry
- Electronic uploads of data (e.g., electronic data deliverables) have been spot checked (at least 10%) to ensure the upload performed as expected
- Hard copy supporting information (e.g., data packages, chains of custody, validation reports, etc.) is evaluated for completeness, archived, and available for audit

Validation --analytical data validation is the responsibility of the EP Directorate. The process will include the following:

- Validate that sample and quality assurance/quality control data and information meet contract specifications
- Assign validation flags, as appropriate
- Identify the analytical supplier
- Identify the analytical method

Verification of calculations -- A person other than the person who generated the query will review for accuracy all compliance related calculations performed in a database through queries. This review will be documented and forwarded to the appropriate record series.

Spreadsheets:
Backups -- All spreadsheets used to hold data and generate reports to be used in demonstrating compliance will be maintained in a secure location. The preferred location is on the Group server. Spreadsheets will be backed up at least weekly.

Verification of data -- All compliance-related data uploaded into a spreadsheet will be verified to be accurate against the original paper copy. Data that are uploaded through electronic means will undergo a 10% verification. Data that are uploaded through manual means will undergo a 100% verification. Someone other than the data entry person must perform the 100% review. This review will be documented and forwarded to the appropriate record series.

Verification of calculations -- A person other than the person who generated the spreadsheet will review for accuracy all compliance-related calculations performed in a spreadsheet. This review will be documented and forwarded to the appropriate record series. Modifications to the function of these spreadsheets will also be verified in this manner.

Software control -- The integrity of spreadsheets will be ensured by limiting access to these spreadsheets to only trained, authorized personnel. Additionally, at least once per year, the function of the spreadsheets will be verified by hand calculations. Documentation of this review will be forwarded to the appropriate record series.

4.4 IMPLEMENTATION RESPONSIBILITIES

The following table lists specific responsibilities:

Who	What
Program Lead	Regularly assess data integrity methods used by MSGP personnel.

5.0 PLANNING AND PERFORMING WORK

Work conducted under this program ensures compliance with the 2008 Multi-Sector General Permit; the Clean Water Act; and DOE Orders 450.1, *Environmental Protection Program*, and 5400.5, *Radiation Protection of the Public and Environment*.

Work that contributes to achieving the quality specifications of the MSGP deliverables will be planned and documented as described in this document and implementing procedures.

Work will be performed according to applicable plans and implementing procedures. The team leader will provide first line supervision of personnel assigned to project tasks to ensure work is performed to achieve project quality specifications. Before changing a work process that affects the project quality specifications, the team leader will ensure the same level of planning and review as used in the initial project planning steps.

5.1 WORK PROCESSES

All work should be regarded as a process. Each process consists of a series of actions and is planned and carried out by qualified workers using specified work processes and equipment under administrative, technical, and environmental controls established by management to achieve an end result. Workers are the best resource of contributing ideas for improving work processes and will be involved in work process design, process evaluation, and providing the feedback necessary for improvement.

All work is planned and performed using the principles of Integrated Safety Management and in compliance with P300, *Integrated Work Management for Work Activities*.

5.3 WORK PERFORMANCE

Management should ensure that the following are clearly identified and conveyed to workers prior to beginning work:

- customer and data requirements for the work and final product;
- acceptance criteria applicable to work and final product;
- hazards associated with the work;
- technical standards applicable to work and final product; and
- safety, administrative, technical, and environmental controls to be employed during the work.

The work processes used to meet the regulatory requirements and the requirements of this plan can be divided as follows:

- Stormwater Pollution Prevention Plans (Multi-Sector General Permit Section 5.0)
- Inspections (Multi-Sector General Permit Section 4.0)
- Monitoring (Multi-Sector General Permit Section 6.0)
- Discharge Monitoring Reports (Multi-Sector General Permit Section 7.1 – Reporting Monitoring Data to EPA)
- Best Management Practices (Multi-Sector General Permit Section 2.0 –Control Measures)
  - — Reporting and Recordkeeping (Multi-Sector General Permit Section 7.0)

5.4 STORMWATER POLLUTION PREVENTION PLAN

Stormwater Pollution Prevention Plan (SWPPP) development and implementation by the regulated industrial facility is required for MSGP compliance (refer to Section 8.0 of the 2008 MSGP for S*ector-Specific Requirements for Industrial Activity* and Appendix D, *Sectors of Industrial Activity Covered by This Permit*). The SWPPP is intended to document the selection, design, and installation of control measures. Additional documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) requirements identified in the 2008 MSGP permit. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at the specific industrial facility to minimize the discharge of pollutants in runoff from the site. These control measures include site-specific Best Management Practices (BMPs), inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site.

The SWPPP development process involves evaluating regulated industrial activities and requiring Facility Management support in implementation, improvement, and revision of the Plans.

5.4.1 Discharge Monitoring Reports

The Laboratory is required to submit analytical results of stormwater monitoring and to keep the results with the facility specific SWPPP. The Laboratory must certify and submit analytical monitoring results obtained from each facility specific sampling location (i.e., the sampling station located at the monitored outfalls) associated with industrial activity on a Discharge Monitoring Report (DMR) form or use it to report any of the following:

- no discharge for all outfalls for a specific monitoring period;
- the industrial facility status has changed to inactive and unstaffed;
- the facility status has changed to active; or
- no further pollutant reductions are achievable for all outfalls and for all pollutants (see Section 6.2.1.2 of the 2008 MSGP).

5.4.2 Annual Site Compliance Evaluation Report

The Laboratory is required to submit an annual report (Attachment 2) to the Environmental Protection Agency (EPA) that includes the findings from the comprehensive site inspection and any corrective action documentation. The documentation must include the following:

- identification of the condition triggering the need for corrective action review;
- date and description of the problem identified;
- summary of the corrective action taken or to be taken;
- notice of whether SWPPP modifications are required as a result of the discovery or corrective action;
- date corrective action was initiated; and
- date corrective action was completed or is expected to be completed.

The following table lists responsibilities:

Who	What
Project Lead	Ensure that SWPPP requirements are performed in accordance with the MSGP.

Facility Management Support	Implement SWPPP requirements as recommended by the Project Lead.
ENV-CP Staff and Deployed Environmental Professionals (DEPs)	Assure SWPPP implementation as required by MSGP.
DEPs	Develop, modify, and update SWPPPs and assist facility personnel with SWPPP implementation.

5.5 INSPECTIONS

The MSGP requires periodic inspection of industrial processes and maintenance of (BMPs) to assure effectiveness of control measures. The Laboratory has implemented a quarterly or monthly inspection process (depending on the industrial facility) to support this determination. A copy of the Routine Inspection Form is provided in Attachment 3.

5.6 STORMWATER MONITORING

Benchmark stormwater monitoring is the required mechanism for determining the effectiveness of corrective actions and meeting the requirements of the MSGP. Refer to Attachment 4, *MSGP Facilities and Stormwater Monitored Outfalls Associated with Industrial Activity 2011***,** for a list of Laboratory sites that have monitoring requirements. Laboratory management has made an investment in time and materials, in addition to a commitment to comply with the 2008 MSGP Permit. All stormwater monitoring is conducted by ENV-CRP personnel. The MSGP Project currently has a network of 23 monitoring stations. Considerations to be used for MSGP stormwater monitoring development decisions will include MSGP requirements, new state water quality standards, Administrative Authority requests, or new permit requirements. Stormwater monitoring will be conducted as specified in the MSGP.

Effluent Limitations stormwater monitoring is required for the following type of facility of LANL:

Regulated Activity	**Parameter**	**Effluent Limit**	**Monitoring Frequency**	**Sample Type**
Discharges from asphalt emulsion facilities	Total Suspended Solids	23.0 mg/L daily max. 15.0 mg/L, 30-day avg.	1/year	grab
	pH	6.0-9.0 s.u.	1/year	grab
	Oil and Grease	10.0 mg/L 30-day avg.	1/year	grab

This determination was made in accordance with Section 1.1.2.4 of the MSGP. The TA-60 Asphalt Batch Plant meets the criteria for effluent limitations monitoring in this section. Exceedances of the effluent limits in this table require immediate action. In addition, if follow-up monitoring after corrective actions also exceeds an effluent limit guideline, an Exceedance Report for Numeric Effluent Limits must be submitted to EPA no later than 30 days after lab results have been received and verified.

Impaired Waters stormwater monitoring is required for discharges made to an impaired water. The canyons within and surrounding Los Alamos National Laboratory are declared as Impaired Waters by the New Mexico Environment Department. The pollutants vary from canyon to canyon and are listed in Attachment 5, *Pollutants Under Impaired Waters Monitoring.* The pollutants may be discontinued in subsequent annual monitoring if the concentration is below background levels in stormwater or if the constituent is not detected.

Visual assessments are also required by the MSGP and are an important tool for collecting information to determine the effectiveness of controls in preventing potential contaminants from migrating off Laboratory property. Accordingly, field personnel must conduct visual assessments for stormwater collected at the monitoring stations or discharged through substantially identical outfalls associated with industrial facilities located throughout the Laboratory. Information recorded will document all observations that are required by the MSGP (see ENV-RCRA-QP-064, *Multi-Sector General Permit Storm Water Visual Inspections*).

The Laboratory's MSGP permit requires stormwater quality monitoring to evaluate compliance with water quality standards and evaluation against benchmarks. Parameters sampled at the monitoring stations are selected based on permit requirements and the results of the previous year.

Four stormwater samples per year are required under the 2008 MSGP, but it is not necessary to collect them in consecutive quarters if climatic conditions that prevented quarterly collection are documented (see *Adverse Weather Conditions* in Section 6.1.5 of the MSGP). Sample locations are listed in Attachment 4, *MSGP Facilities and Stormwater Monitored Outfalls Associated with Industrial Activity 2011*, and collection will be conducted in accordance with LANL and NPDES Permit requirements and the current year MSGP Sampling and Analysis Plan.

Stormwater samples are used to demonstrate compliance with water quality standards and requirements to evaluate results against benchmark parameters (Attachments 5 and 6). Any persons involved in the preparation, retrieval, and analysis must maintain positive control of samples at all times until sample disposal. ENV-RCRA personnel will follow guidance in the Associate Directorate for Environmental Programs (ADEP) document ENV-WQH-QP-029, *Creating and Maintaining a Chain of Custody*, as well as, ENV-RCRA-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples*, and ENV-RCRA-QP-048, *Processing MSGP Storm Water Samples*.

Chain of custody is maintained during:

Activity	Responsibility
Sample collection and preparation	All persons (other than analytical personnel) performing sample preparation and collection will be trained to sample collection procedures and must adhere to the chain of custody requirements therein.
Analysis	Analytical laboratories performing sample analysis will maintain sufficient procedures to ensure positive control of samples as specified in the existing Statement of Work.
Storage/ disposal	Analytical laboratories will maintain retained samples and/or sample portions under chain of custody until reanalysis, or ultimate disposal.

The LANL Sample Management Office (SMO) will be the central point for all analytical laboratory selection, evaluations, sample submittal, and data return. The SMO will evaluate potential analytical laboratories, prepare analytical statements of work that include requirements, and arrange contracts with selected laboratories for analysis of all samples. The SMO will accept samples from field collection personnel, process the sample, ship the samples to the off-site analytical laboratories, and receive the data packages from the laboratories.

All analytical data will be received from analytical laboratories in electronic format and uploaded into a database. All received data will be checked for completeness and adherence to contract requirements. After uploading, all data will undergo verification and validation (V&V) for evidence of laboratory contamination, improper analytical method, and other analytical issues which could potentially affect data quality.

Field data collected by sample collection personnel will be verified and validated by the SMO when field personnel deliver samples to the SMO.

If significant V&V issues are identified, results will be forwarded to and discussed with the responsible project leads.

Data issues that result from procedural failures, personnel errors, or other failures to follow requirements will be documented as issues and corrected according to ENV-DO-QP-113, *Tracking Issues and Actions*.

The following table lists responsibilities:

Who	What
Project Lead	Ensure that all project monitoring requirements are performed in accordance with the MSGP. Review and update the MSGP Sampling and Analysis Plan annually.

	When complete, communicate findings to the team members for implementation. Make appropriate arrangements with the SMO to accept, process, and submit samples to an analytical laboratory for required analyses as specified in the SAP.
MSGP Water Quality Compliance Personnel	• Implement monitoring program as required by the MSGP Project Lead. • Conduct stormwater sampling in accordance with the MSGP Sampling and Analysis Plan and applicable procedures. • Ensure procedures for sample handling and control during sample preparation and retrieval are followed.
Sample Management Office	• Develop Statements of Work (SOW) for all analytical laboratories that perform analytical work for the MSGP project in accordance with P840-1, *Procurement Quality*. • Ensure analytical laboratories comply with the DOE's SOW. Conduct an annual audit of the laboratory to ensure compliance with the SOW. • Approve Statements of Work for analytical laboratories that are contracted to analyze water samples. • Approve analytical laboratories that are contracted to analyze water samples for regulatory compliance purposes. • Accept samples and submit them to and approved analytical laboratory for analysis. • Track progress of samples at the analytical laboratory and resolve issues with sample analysis. • Receive data packages from the analytical laboratory and enter data into the database. • Provide the MSGP Project Lead with monthly invoice updates. • Perform V&V of field data submitted and uploaded from forms when samples are submitted to the SMO.
Operations Integration Office (OIO), Systems Integration (SI)	Perform V&V of data packages uploaded by the SMO or send data packages to a subcontractor company for independent V&V.

5.7 Discharge Monitoring Reports

The Laboratory is required to submit analytical results of stormwater monitoring and to keep the results with the specific SWPPP. The Laboratory must submit analytical monitoring results obtained from each monitoring station associated with industrial activity on a MSGP Discharge Monitoring Report (MDMR) form (one form must be submitted for each storm event from which, a sample was collected).

MDMRs shall be written in accordance with ENV-RCRA-QP-044, *Preparing Storm Water Discharge Monitoring Reports (MDMRs) for the NPDES Multi-Sector General Permit*. MDMRs shall be submitted to EPA within 30 calendar days of receiving validated analytical results. Refer to the DMR language under the SWPPP Section above for additional requirements.

Site analytical requirements are defined by the industrial activity in the MSGP permit. All MSGP analytes applicable to LANL are consistent with the requirements of 40 CFR Part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants.*

Sample analytical requirements vary by site depending on the industrial activities performed at the site. Refer to Attachment 5 for a list of analytes by industrial sector. If an insufficient quantity of sample is available, then sample collection will be prioritized at that location for future events. Additional samples may be collected to meet permit requirements.

ENV-RCRA shall refer to the requirements of the 2008 Multi-Sector General Permit, and the most current MSGP Sampling and Analysis Plan to determine the priorities of required analyses.

The following table lists responsibilities:

Who	What
Project Lead	• Ensure implementing procedures for sample analyses are used. • Ensure that MDMRs are submitted to EPA and NMED in accordance with the MSGP.
MSGP Water Quality Compliance Personnel	Assure MDMRs are completed and certified as required by the MSGP and have received a full quality assurance review.

5.8 Adverse Weather Conditions and Climates with Irregular Stormwater Runoff

Section 4.2.3 of the 2008 MSGP allows the industrial facility to take a substitute sample during the next qualifying storm event when adverse weather conditions prevent the collection of samples during a specific quarter. Adverse weather conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling impractical, such as drought or extended frozen conditions. Documentation of the rationale for no visual assessment for the quarter must be included in the facility specific SWPPP.

Since LANL is located in an area where limited rainfall occurs during parts of the year (i.e., in a semi-arid climate) and has periods of freezing conditions, LANL has identified an alternative monitoring period of four quarters as follows for each calendar year.

- April 1-May 31

- June 1-July 31
- August 1-September 30
- October 1-November 30

The following table lists specific responsibilities.

Who	What
Project Lead	Ensure that the monitoring schedule is documented in facility specific SWPPPs and provided to EPA on the MDMRs.

5.9 REPORTING AND RECORDKEEPING

All monitoring data shall be collected in accordance with the requirements specified in the 2008 MSGP. LANL will submit monitoring results to EPA within 30 days of receiving validated laboratory results. The address for submittal of monitoring results is as follows.

U.S. Environmental Protection Agency
Office of Water, Water Permits Division
Mail Code 4203M, ATTN: MSGP Reports
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

LANL shall keep copies of the following documentation for a period of at least 3 years from the date that LANL's coverage under the MSGP expires or is terminated.

- SWPPP (including any modifications made during the term of the 2008 MSGP)
- Additional documentation requirements as identified in Section 5.4 of the MSGP
- All reports and certifications required by the MSGP
- Monitoring data
- Records of all data used to complete the NOI.

The following table lists specific responsibilities:

Who	What
Project Lead	Periodically audit MSGP records to ensure documentation of compliance is being retained.
Deployed Environmental Professionals	Retain records as required by the MSGP for industrial facilities located in their FOD.

5.10 BEST MANAGEMENT PRACTICES

It is critical that the Laboratory be able to effectively inspect and maintain the Best Management Practices that have been installed at various locations. Quarterly inspections must be completed and provided to the Project Lead for inclusion into the records system. In addition, the Project Leader conducts a Comprehensive Annual Site Inspection and writes a report to document the status of BMPs and other identified corrective actions. This report is sent to EPA each year. Laboratory management has made an investment in time and materials, in addition to a commitment to minimizing the potential migration of contaminants in stormwater. Report findings are evaluated and in conjunction with facility personnel, BMPs are modified, installed, or removed as necessary.

The following table lists responsibilities.

Who	What
Project Lead	Assist facility personnel and Deployed Environmental Professionals with implementation, inspection, and maintenance of BMPs at MSGP facilities.
Facility Management Support	• Coordinate with Project Lead and provide funding as needed to install, inspect, maintain and implement identified BMPs. • Certify the corrective actions identified by the Project Lead and/or facility personnel (or their representatives) for their individual facilities in the Annual Report.

5.11 INFORMATION MANAGEMENT

The Water Quality Database is a database information system designed in part to support the information management (IM) needs of the Laboratory's MSGP. MSGP support includes stormwater discharge monitoring reporting, Geographic Information System (GIS) development, and other IM activities as needed.

The following table lists responsibilities:

Who	What
Project Lead	Coordinate with IM support personnel to meet regulatory requirements.

5.12 RESPONDING TO WATER QUALITY EXCEEDANCES

The identification of a pollutant source(s) contributing to a water quality exceedance will be addressed through the creation of a corrective action that is entered into the Corrective Acton

Report database in accordance with ENV-DO-QP-113, *Tracking Performance Feedback and Actions* and *ENV-RCRA-QP-022, MSGP Stormwater Corrective Actions*. Federal stormwater regulations implemented under the Laboratory's MSGP (40 CFR 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System) require that corrective action be taken if exceedances of water quality standards or MSGP numeric effluent limits are identified. Corrective actions are typically accomplished by modifying, as appropriate, existing BMPs and SWPPPs.

When a water quality exceedance occurs, the Laboratory will submit the data on the required MDMRs, investigate the occurrence, and document corrective actions.

When an exceedance of the MSGP benchmark parameters is detected, the Project Lead will assure the analytical data is reviewed, notify appropriate SWPPP owners, and recommend and track corrective actions where required.

The following steps lead to corrective actions:

STEP	**Action**
1	Establish that an analytical result from a location is valid and has exceeded a standard or MSGP benchmark.
2	Evaluate and demonstrate that the analyte is of LANL origin, if possible.
3	Determine the source and assign responsibility for the corrective action.
4	Develop a corrective action plan.

The following table lists responsibilities:

Who	**What**
Project Lead	• Assure that analytical data is reviewed and accurate. • Notify appropriate SWPPP owners, Laboratory management, and Deployed Environmental Professionals. • Develop a corrective action plan. • Follow up with corrective actions if required. • Track corrective actions.
Facility Management and DEP	• Review analytical data with Project Lead and provide input into a possible corrective action necessary to improve water quality where needed. • Evaluate and improve BMPs in accordance with site conditions, industry standards, and manufacturer

	recommendations.

5.13 Instrumentation and Equipment

Compliance will be tracked by performing inspections of samplers and other associated equipment, inspecting BMPs, and conducting annual site compliance evaluations. Adequate records will be maintained to demonstrate the operating history of essential instrumentation and equipment.

LANL will properly operate and maintain all systems of monitoring and control and related appurtenances which are installed or used to achieve compliance with the MSGP and the SWPPP. Backup instrumentation and equipment will be timely deployed in the event of equipment failure.

Instrument calibration is essential for documenting the quality of data obtained with the instrument. All technical work that depends upon the accuracy of data will be performed using equipment for which the calibration status and limits of accuracy are known and controlled.

Field team personnel will calibrate and perform maintenance procedures on all monitoring and analytical field instruments to ensure accuracy of measurements and will maintain appropriate records of such activities. All field calibrations will be documented as prescribed by procedures or manufacturer's instructions.

The following table lists specific responsibilities.

Who	**What**
Project Lead	• Ensure data are collected and equipment is operated and maintained in accordance with project requirements. • Provide equipment maintenance and calibration specifications and ensure MSGP Water Quality Compliance Team personnel operate and conduct field activities in accordance with implementing procedures and specific work orders.

6.0 DESIGN

Design activities will be conducted and reviewed in accordance with PD340, *Conduct of Engineering* and P341, *Engineering Process Manual*.

Design standards under this program include, but are not limited to temporary and permanent BMPs, corrective action measures, and stormwater monitoring support.

Design inputs will be specified and approved on a timely basis for making design decisions. Inputs will contain the level of detail required to permit the performance of design activities correctly.

Formal design reviews, including design verifications and evaluation of design changes, will be conducted to ensure that the design input is correctly incorporated into the design output. Changes to design will undergo the same review as the original design.

Verification and validation of the adequacy of designs are conducted before relying on the performance of the design function. Verification and validation are conducted in accordance with implementing procedures.

The following table lists responsibilities.

Who	What
Project Lead	• Provide input to the design process in accordance with appropriate standards, requirements, and implementing procedures. • Determine the qualifications required to perform a review of design documents. • Identify a resource with skills, knowledge, ability, training, and certifications required to complete the review of the facility engineering design documents. • Communicate the results of the review to the requestor.
ENV-CP Staff	Review design documents and requests as assigned. Inform the Project Lead of concerns regarding the facility engineering designs.

7.0 PROCUREMENT

Items and services required for this process are commercial grade in nature and no special procurement requirements or needs are necessary. All procurements will be made in accordance with P840-1, *Procurement Quality*. For items and all services for which special requirements are necessary, the Project Lead and project members will identify such items or services.

The following table lists responsibilities:

Who	What
Group Leader	Ensure all procurements are conducted in accordance with P840-1.
Project Lead	Recommend to Group Leader contracting items and services. Develop acceptance criteria.
ENV-CP Staff	Identify potential suppliers of products or services necessary to complete work activities that must be procured from outside ENV-RCRA.

8.0 INSPECTION AND ACCEPTANCE TESTING

Any materials or services will be inspected and/or tested prior to acceptance for use in this project in accordance with P330-8, *Inspection and Test for Acceptance*. Most supplies used during performance of project activities are commercial grade in nature and require no special acceptance practices or procedures.

The following table lists responsibilities:

Who	What
Group Leader	Ensure procedures for inspection meet SD330, *Los Alamos National Laboratory Quality Assurance Program* requirements.
Project Lead	Verify that all materials and services meet acceptance criteria.
ENV-CP Staff	Follow established procedures for inspection and acceptance testing.

9.0 MANAGEMENT ASSESSMENT

The ENV-CP Group conducts internal management assessments of projects and programs in accordance with the requirements in P328-3, *Management Assessment* and P328-4, *Management Observation and Verification*. Assessments of the program are documented and filed as records.

When violations of requirements are found during a management assessment, a nonconformance report is initiated in accordance with P330-6, *Nonconformance Reporting* for nonconforming items. Nonconforming services or processes are tracked and documented in accordance with P322-4, *Issues and Corrective Action Management*.

The following table lists responsibilities:

Who	What
Group Leader	Ensure management self-assessments for the MSGP program are conducted as specified in implementing procedures.
Project Lead	Ensure program management self-assessments are conducted.

10.0 INDEPENDENT ASSESSMENT

Independent assessments are those assessments conducted by organizations external to ENV-RCRA. As required by the SD330, *Los Alamos National Laboratory Quality Assurance Program*, this program may be assessed by outside organizations in accordance with P328-2, *Independent Assessment*.

Periodically audits/assessments will be conducted, with input from the Project Lead identifying one or more areas of the project to be audited.

The following table lists responsibilities:

Who	What
Project Lead	• Approve audit schedules. • Provide input to the QA Specialist as to the content of audit. • Review audit reports for factual accuracy. Address all findings and implement corrective actions as appropriate.
QA Specialist	• Identify areas to be addressed during internal audits. • Contract with the Quality Management Group to perform annual internal audits. • Review audit procedures to ensure they meet the requirements in this section.
Team Members	Cooperate with auditors by providing information, data, etc. Implement corrective actions as directed by the Project Lead.

11.0 ATTACHMENTS

Attachment 1- MSGP Program Organization

Attachment 2 – Annual Reporting Form

Attachment 3 – Routine Inspection Form

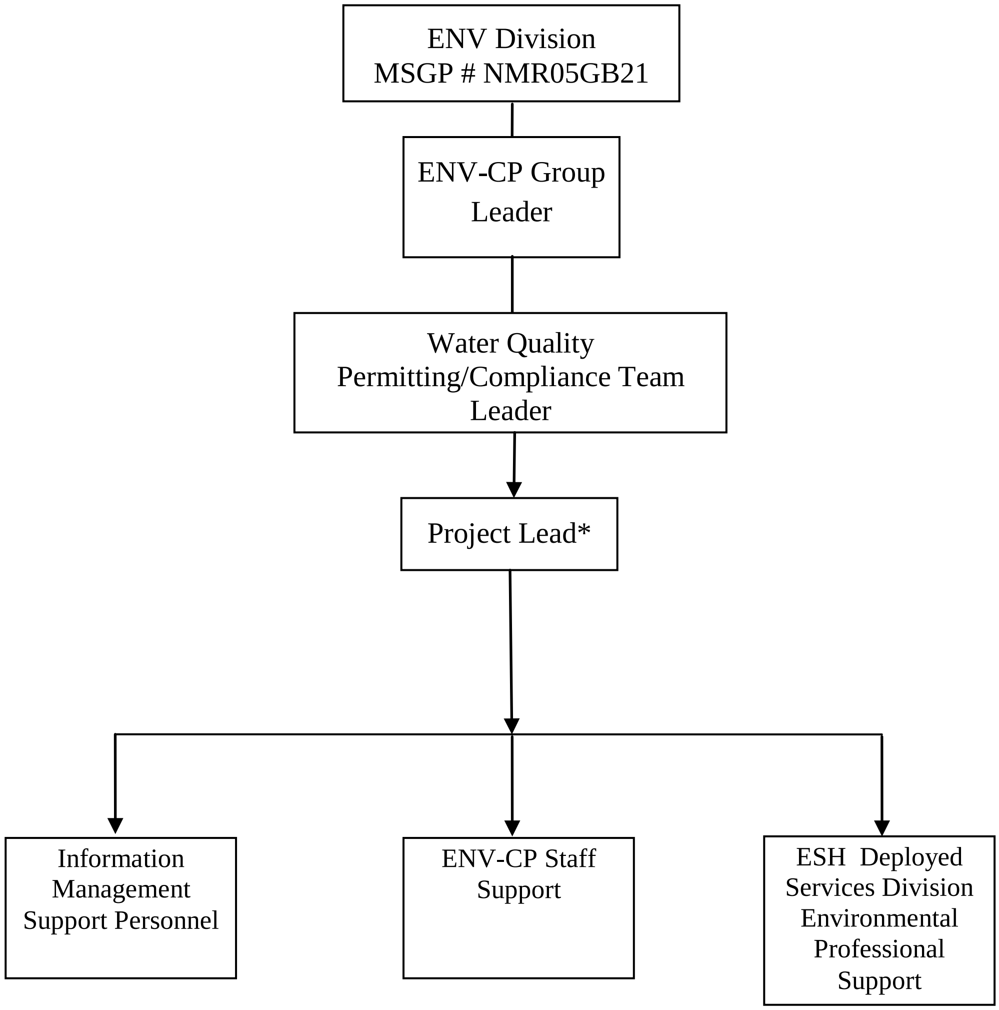
Attachment 4 – MSGP Facilities and Storm Water Monitored Outfalls Associated with Industrial Activity 2011, Permit NMR05GB21

Attachment 5 – Pollutants under Impaired Waters Monitoring

Attachment 6 – Analytes by Industrial Sector

Attachment 7 – References and Guidance Documents

ATTACHMENT 1- MSGP PROGRAM ORGANIZATION



*Project Lead acts as liaison and will work directly with Team Leaders for staff assignments.

Attachment 2 – Annual Reporting Form

NPDES Permit Tracking No.:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

Annual Reporting Form

A. GENERAL INFORMATION

1. Facility Name:

2. NPDES Permit Tracking No.:

3. Facility Physical Address:

a. Street:

b. City: c. State: d. Zip Code: -

4. Lead Inspectors Name: Title:

Additional Inspectors Name(s):

5. Contact Person: Title:

Phone: - - Ext. E-mail:

6. Inspection Date: / /

B. GENERAL INSPECTION FINDINGS

1. As part of this comprehensive site inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to stormwater?
☐ YES ☐ NO

If NO, describe why not:

NOTE: *Complete Section C of this form for each industrial activity area inspected and included in your SWPPP or as newly identified in B.2 or B.3 below where pollutants may be exposed to stormwater.*

2. Did this inspection identify any stormwater or non-stormwater outfalls not previously identified in your SWPPP? ☐ YES ☐ NO

If YES, for each location, describe the sources of those stormwater and non-stormwater discharges and any associated control measures in place:

NPDES Permit Tracking No.: |_|_|_|_|_|_|_|_|_|_|

3. Did this inspection identify any sources of stormwater or non-stormwater discharges not previously identified in your SWPPP? ☐ YES ☐ NO

If YES, describe these sources of stormwater or non-stormwater pollutants expected to be present in these discharges, and any control measures in place:

4. Did you review stormwater monitoring data as part of this inspection to identify potential pollutant hot spots? ☐ YES ☐ NO ☐ NA, no monitoring performed

If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review:

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters, and the condition of and around outfalls, including flow dissipation measures to prevent scouring:

6. Have you taken or do you plan to take any corrective actions, as specified in Part 3 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive site inspection?
☐ YES ☐ NO

If YES, how many conditions requiring review for correction action as specified in Parts 3.1 and 3.2 were addressed by these corrective actions? |_|_|

NOTE: *Complete the attached Corrective Action Form (Section D) for each condition identified, including any conditions identified as a result of this comprehensive stormwater inspection.*

NPDES Permit Tracking No.: | | | | | | | | | | |

C. INDUSTRIAL ACTIVITY AREA SPECIFIC FINDINGS

Complete one block for each industrial activity area where pollutants may be exposed to stormwater. Copy this page for additional industrial activity areas.

In reviewing each area, you should consider:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas.

INDUSTRIAL ACTIVITY AREA ______:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA ______:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised c necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA ______:

Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.:

NOTE: *Copy this page and attach additional pages as necessary*

INDUSTRIAL ACTIVITY AREA ______:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA ______:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA ______:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.: ☐☐☐☐☐☐☐☐☐

D. CORRECTIVE ACTIONS

Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in this comprehensive stormwater inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action # ☐☐ of ☐☐ for this reporting period.

2. Is this corrective action:
   - ☐ An update on a corrective action from a previous annual report; or
   - ☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release or discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe): ______________________________

4. Briefly describe the nature of the problem identified:

5. Date problem identified: ☐☐ / ☐☐ / ☐☐☐☐

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Benchmark monitoring
   - ☐ Notification by EPA or State or local authorities
   - ☐ Other (describe): ______________________________

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:

8. Did/will this corrective action require modification of your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: ☐☐ / ☐☐ / ☐☐☐☐

10. Date correction action completed: ☐☐ / ☐☐ / ☐☐☐☐ or expected to be completed: ☐☐ / ☐☐ / ☐☐☐☐

11. If corrective action not yet completed, provide the status of corrective action at the time of the comprehensive site inspection and describe any remaining steps (including timeframes associated with each step) necessary to complete corrective action:

NPDES Permit Tracking No.: | | | | | | | | | |

E. ANNUAL REPORT CERTIFICATION

1. Compliance Certification

Do you certify that your annual inspection has met the requirements of Part 4.2 of the permit, and that, based upon the results of this inspection, to the best of your knowledge, you are in compliance with the permit? ☐ YES ☐ NO

If NO, summarize why you are not in compliance with the permit:

2. Annual Report Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Representative Printed Name: ______________________ Title: ______________________

Signature: ______________________ Date Signed: ______________________

ATTACHMENT 3 – ROUTINE INSPECTION FORM

Name of Facility:	**Responsible FOD (Name & Organization):**	
Qualified Inspector(s): **Others Present:**	**Inspection type:** □ **Quarterly** □ **Other**	**Date of inspection (MM/DD/YYYY):** **Time of inspection:**

Weather: ❑ **Clear** ❑**Cloudy** ❑ **Rain** ❑ **Sleet** ❑ **Fog** ❑ **Snow** ❑ **High Winds** ❑ **Other:**
Temperature: ° F **Is Inspection Being Conducted During a Storm Water Discharge?** ❑**Yes** ❑**No**

#	Structural Control Measures (BMP)s	Location	Operating Effectively (Yes or No)?	If No, Need to Maintain (M), Repair (R) or Replace (RP)?	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12					

Were additional BMPs or Control Measures implemented? □ **Yes** □ **No Describe:**

Were previously identified conditions corrected before the next anticipated storm event? □ **Yes** □ **No If No, describe reason:**

Area/Activity (Areas of Industrial Materials or Activities Exposed to Storm Water)	**Inspected ?**	**Controls Adequate?**	**Corrective Action Needed and Notes (List area letter with comments below)**
A. Material loading/unloading & storage areas			
B. Equipment operations & maintenance areas			
C. Fueling Areas			
D. Outdoor vehicle & equipment washing areas			
E. Waste Handling & disposal areas			
F. Erodible areas / construction			
G. Non-storm water / illicit connections			

H. Salt storage piles or pile containing salt			
I. Dust generation & vehicle tracking			
Are the SWPP Plan maintenance, schedules and procedures being implemented at the facility? □ Yes □ No			
Were any Corrective Actions initiated or completed? □ Yes □ No Describe:			
Are there any conditions requiring Corrective Action? □ Yes □ No If Yes, List Number of Corrective Actions Required _____ **(Note – You need enter a Corrective Action in the MSGP Corrective Action Report database for each listed)**			

ATTACHMENT 4 -- MSGP FACILITIES AND STORM WATER MONITORED OUTFALLS ASSOCIATED WITH INDUSTRIAL ACTIVITY 2011, PERMIT NMR05GB21

Location	Permitted Facility	Operation	Activity	Sector	Monitored Outfall	• Canyon
TA-15-185	TA-15-185 PHERMEX	Vehicle Maintenance Shop	Vehicle Maintenance	P	15-PHRMX-1	• Water
TA-3-0034	TA-3-0034 Metal Shop	Fabricated Metals	Fabricated Metals	AA	3-MST-1	• Mortandad
TA-3-22	TA-3-22 Power & Steam Plant	Power Plant	Steam Electric Power	O	3-PSP-1 3-PSP-5 3-PSP-8	• Sandia • •
TA-3-38	TA-3-38 Metals Fab Shop	Metal Shop	Fabricated Metals	AA	3-MFS-1	• Sandia
TA-3-39	TA-3-39 & 102 Metal Shop	Metal Shop	Fabricated Metals	AA	3-TS-1	• Pajarito
TA-3-66	TA-3-66 Sigma Complex	Sigma Foundry	Primary Metals	F	3-Sigma-6	• Sandia
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-1	• Pajarito
TA-54	TA-54 Area G	Area G -North Side	TSD	K	54-G-2	• Canada del Buey
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-3	• Pajarito
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-4	• Pajarito
TA-54	TA-54 Area L	Area L	TSD	K	54-L-1	• Canada del Buey
TA-54-38	TA-54 RANT	RANT	TSD	K	54-RANT-1	• Canada del Buey
TA-60	TA-60 Asphalt Batch Plant	Asphalt Batch Plant	Asphalt Paving	D	60-ABP-1	• Mortandad
TA-60	TA-60 MRF	Materials Recycling Facility	Scrap Recycling	N	60-MRF-1	• Sandia
TA-60-250	TA-60 Roads and Grounds	Roads & Grounds Facility	Vehicle Maintenance & Storage	P P P	60-RG-1 60-RG-3 60-RG-8	• Mortandad • Sandia • Sandia
TA-60-1	TA-60-1 Heavy Equipment Yard	Motor pool	Vehicle Maintenance	P	60-HEY-2	• Sandia
TA-60-2	TA-60-2 Warehouse	Motor pool	Vehicle Maintenance	P	60-WH-1	• Sandia
TA-9-28	TA-9-28 Heavy Equipment Maintenance	Motor pool	Vehicle Maintenance	P	9-HEM-1	• Pajarito

ATTACHMENT 5 – POLLUTANTS UNDER IMPAIRED WATERS MONITORING

Permitted Facility	Monitored Outfall	Assessment Unit	Canyon	Pollutant
TA-54 Area G TA-54 Area L TA-54-RANT	54-G-2 54-L-1 54-RANT-1	NM-128.A_00	Canada del Buey (within LANL)	PCBs Aluminum Gross Alpha
TA-54 Area G TA-54 Area G TA-54 Area G	54-G-1 54-G-3 54-G-4	NM-128.A_08	Pajarito Canyon (within LANL below Arroyo de la Delfe)	PCBs Aluminum Copper Gross Alpha
TA-15-185 PHERMEX	15-PHRMX-1	NM-128.A_13	Water Canyon (within LANL below Area-A Canyon)	PCBs Aluminum Gross Alpha
TA-3-39 & 102 Metal Shop	3-TS-1	NM-128.A_15	Two Mile Canyon (Pajarito to headwaters)	PCBs Aluminum Gross Alpha
TA-9-28 Heavy Equipment Maintenance	9-HEM-1	NM-128.A_16	Arroyo de la Delfe (Pajarito Canyon to headwaters)	Aluminum Mercury Gross Alpha
TA-60 Asphalt Batch Plant TA-3-0034 Metal Shop TA-60 Roads and Grounds	60-ABP-1 3-MST-1 60-RG-1	NM-9000.A_042	Mortandad Canyon (within LANL)	Aluminum Copper Gross Alpha
TA-3-38 Metals Fab Shop TA-3-22 Power & Steam Plant TA-3-22 Power & Steam Plant TA-3-22 Power & Steam Plant TA-3-66 Sigma Complex TA-60-1 Heavy Equipment Yard TA-60 MRF TA-60 Roads and Grounds TA-60 Roads and Grounds TA-60-2 Warehouse	3-MFS-1 3-PSP-1 3-PSP-5 3-PSP-8 3-Sigma-6 60-HEY-2 60-MRF-1 60-RG-3 60-RG-8 60-WH-1	NM-9000.A_047	Sandia Canyon (Sigma Canyon to NPDES outfall 001)	PCBs Aluminum Copper Gross Alpha Mercury

ATTACHMENT 6 – ANALYTES BY INDUSTRIAL SECTOR

Permitted Facility	Monitored Outfall	Sector	Activity	Analyte	Monitoring Requirement
TA-3-0034 Metal Shop	3-MST-1	AA	Fabricated Metals	Aluminum	Quarterly Benchmark Monitoring (QBM)
TA-3-38 Metals Fab Shop	3-MFS-1			Iron	QBM
TA-3-39 & 102 Metal Shop	3-TS-1			Nitrate plus Nitrite Nitrogen	QBM
				Zinc	QBM
TA-60 Asphalt Batch Plant	60-ABP-1	D	Asphalt Paving	Oil and Grease	Effluent Limitations Guidelines (ELG)
				pH	ELG
				Total Suspended Solids	QBM and ELG
TA-3-66 Sigma Complex	3-Sigma-6	F	Primary Metals	Copper	QBM
				Zinc	QBM
TA-54 Area G	54-G-1	K	Treatment, Storage or Disposal Facility (TSD)	Ammonia	QBM
TA-54 Area G	54-G-2			Arsenic	QBM
TA-54 Area G	54-G-3			Cadmium	QBM
TA-54 Area G	54-G-4			Chemical Oxygen Demand	QBM
TA-54 Area L	54-L-1			Cyanide	QBM
TA-54 RANT	54-RANT-1			Lead	QBM
				Magnesium	QBM
				Mercury	QBM
				Selenium	QBM
				Silver	QBM
TA-60 MRF	60-MRF-1	N	Scrap Recycling	Aluminum	QBM
				Chemical Oxygen Demand	QBM
				Copper	QBM
				Iron	QBM
				Lead	QBM
				Total Suspended Solids	QBM
				Zinc	QBM
TA-3-22 Power & Steam Plant	3-PSP-1	O	Steam Electric Power	Iron	QBM
	3-PSP-5				
	3-PSP-8				

ATTACHMENT 7 – REFERENCES AND GUIDANCE DOCUMENTS

- 40 CFR 122, *EPA Administered Permit Programs*
- 40 CFR 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants.*
- Clean Water Act, Title 33 U.S.C. 1251
- DOE O 414.1C, *Quality Assurance*
- DOE Order 450.1, *Environmental Protection Program*
- DOE Order 5400.5, *Radiation Protection of Public and Environment*
- EPA QA/G-4, *Guidance for the Data Quality Objectives Process*

LANL Documents:

- P322-4, *Laboratory Performance, Feedback, and Improvement*
- P328-3, *Management Assessments*
- P328-4, *Management Observation and Verification*
- P330-6, *Nonconformance Reporting*
- P330-8, *Inspection and Test for Acceptance*
- P340, *Conduct of Engineering*
- P341, *Engineering Process Manual*
- P401, *Procedure to Identify, Communicate, and Implement Environmental Requirements*
- P407, *Water Quality*
- P840-1, *Procurement Quality*

ENV Documents:

- ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*
- ENV-DO-QP-106, *Document Control*
- ENV-DO-QP-113, *Tracking Performance Feedback and Actions*
- ENV-DO-QP-115, *Personnel Training*
- ENV-CP-QP-022, *MSGP Storm Water Corrective Actions*
- ENV-CP-QP-044, *Preparing Storm Water Discharge Monitoring Reports (MDNRs) for NPDES MSGP*
- ENV-CP-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples*
- ENV-CP-QP-048, *Processing MSGP Storm Water Samples*
- ENV-CP-QP-064, *Multi-Sector General Permit Storm Water Visual Inspections*
- ENV-WQH-QP-029, *Creating and Maintaining a Chain of Custody*
- Surface Water Monitoring Plan, October 2001, Rev. 0.0

ENV-CP-QP-007.9		
Effective Date: July 19, 2013	Next Review Date: June 19, 2015	Los Alamos NATIONAL LABORATORY EST. 1943

Environment, Safety, Health Directorate

Environmental Protection – Compliance Programs Quality Procedure

Spill Investigations

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ADESH-OIO, QA Specialist	Signature on file	7/18/13

Derivative Classifier: ☐ **Unclassified** ☒ **DUSA** ____**ENVPRO**__

Name:	Organization:	Signature:	Date:
Ellena Martinez	ADESH-OIO	Signature on file	7/23/13

Approval Signatures:

Subject Matter Expert: Jake Meadows	Organization: ENV-CP	Signature: Signature on file	Date: 7/18/13
Responsible Line Manager: Mike Saladen	Organization: ENV-CP Team Lead	Signature: Signature on file	Date: 7/18/13
Responsible Line Manager: Anthony Grieggs	Organization: ENV-CP Group Leader	Signature: Signature on file	Date: 7/19/13

CONTROLLED DOCUMENT

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	12/98	New Document.
1	06/00	Annual review, added Cerro Grande fire hazards
2	07/01	Annual review
3	06/03	Annual review
4	04/04	Annual review, changes to HCPs
5	02/07	Annual review, changes to reflect organizational restructure
6	07/08	Annual review
7	09/10	Biennial Review and revision
8	04/11	Removed prerequisites, added note re: on-call spill reporting.
9	07/13	Biennial review and revision, implemented new procedure format.

Table of Contents

1.0 PURPOSE

This Environmental Protection – Compliance Programs Group (ENV-CP) procedure describes processes and implements requirements for spill investigations.

2.0 SCOPE

This procedure applies to all ENV-CP staff and personnel conducting spill investigations.

2.1 HAZARD REVIEW

The work described in this procedure is field work and has a **LOW hazard** rating as documented by submittal of a completed *ENV Low Hazard Verification form* to the Quality Assurance Specialist.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-CP staff and contract personnel who perform spill response and investigation require training on this procedure.

Annual re-training to this procedure is required. Specific training requirements will be updated as needed.

The training method for this procedure is part "self-study" and part on-the-job training (OJT). The OJT training is to be conducted by a Team Leader or person designated as Subject Matter Expert (SME) by the ENV-CP Group Leader. The self-study and OJT will be documented in accordance with ENV-DO-QP-115, *Personnel Training*.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

- None

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records generated as a result of this procedure are to be submitted in accordance with ENV-DO-QP-110, *Records Management*.

➢ Field notebook documentation of the release including:
  - time and date of the release
  - time and date of ENV-CP notification
  - location of the release and from where the release occurred (equipment, etc,)
  - type of material released
  - quantity of material released
  - if an impact to a watercourse, SWMU, or PRS occurred

- time release was stopped
- any immediate mitigating actions implemented to contain or control the release

➢ Any written report and verbal notification list generated should the release be deemed reportable.

- Non-Reportable LANL Spill Report (Attachment 2)

5.0 WORK PROCESSES

Responsibility is to assure the immediate mitigation and timely notification of appropriate regulatory organizations in the event of a spill or unplanned discharge that has or may affect the environment. Work requires frequent and unscheduled site visits to any area of the Laboratory during a spill or unplanned release as support staff for the on-scene EO-EM Incident Commander.

Specific activities associated with Spill Response and Investigation:

- Respond to the spill or unplanned release site;
- Report to the On-Scene EO-EM Incident Commander and Site Safety Officer;
- Receive site safety requirements;
- Provide decision support;
- Investigate the nature and extent of the spill or unplanned release;
- Evaluate the potential environmental impact to water quality;
- Report the occurrence to the regulatory agencies, if necessary; and
- Provide support to mitigation plan and implementation.

5.1 FIELD ACTIVITY

If the spill or unplanned discharge is determined to be a non-emergency event by EO-EM response, such as a release of potable water, perform the following steps:

Step	Action
1	Perform a site visit in coordination with the Facility Operations Director designee.
2	Assess potential environmental damage.
3	Provide mitigation measures and requirements.
4	Document the event.
5	Notify regulatory agencies and DOE, if necessary.
6	Facilitate collection of samples, if necessary.

For emergency response, perform the following steps:

Step	Action
1	Report to on-scene commander and await instructions.
2	Perform a site visit in coordination with EO-EM.

3	Adhere to access requirements as developed by the EO-EM Site Safety Officer and Incident Commander.
4	Identify source and cause of release and document.
5	Provide notification and written report if necessary.
6	Facilitate collection of samples if necessary and safe to do so.

If sample collection is required, contact the following sampling personnel:

- ENV-CP
  - NPDES outfall
  - Sanitary treatment solids
  - Wastes and chemical spills (liquid, solid, hazardous)
- ADEP Corrective Actions Program
  - Surface water
  - Storm water runoff
  - Groundwater
  - Sediments

5.2 Communication

Take a cellular phone that will transmit from the location to be visited. Also take a contact pager to receive messages.

If cellular service is unavailable, use a portable radio set to the appropriate radio frequency.

If in a secure area where cell phone use is prohibited, use the radio. Be sure to have radio checked and authorized for use within secure areas or within the boundaries of the WFO FOD or WX Division. Government-owned cellular phones, with batteries removed, may be brought into the secure area but used only if approval is given by the EO-EM Incident Commander or FOD or designee. Rules of use for Smartphones and other mobile devices (BlackBerry, iPhones, iPads) can be found on the Computing Communications webpage for mobile devices, http://int.lanl.gov/computing/communications/mobile/index.shtml.

Radio or cellular contact must be established with a designated contact prior to leaving ENV-CP and upon arrival/departure at the site in accordance with ENV-DO-QP-100, *General Field Safety*.

The Incident Commander can make special communication exceptions.

All photography at LANL must adhere to the procedure and P202-5, *Prohibited and Controlled Articles*.

Wastes generated from activities described in the procedure will be properly characterized, managed, and disposed in accordance with P409, *Waste Management*, P930-1, *LANL Waste Acceptance Criteria*, and P403, *Environmental Aspects Identification Requirement*.

5.3 FACILITY MANAGEMENT WORK CONTROL REQUIREMENTS FOR FIELD ACTIVITIES

Most field activities performed by the ENV-CP spill response personnel are impacted by facility management work control requirements. Requirements vary between the respective Facility Operations Divisions (FODs) and therefore necessitate ENV-CP response personnel to acquire FOD approval for site access in advance of starting work activities. The exception to this is in response to emergency situations as support to EO-EM staff.

Should work be required to stop/pause, reference P101-18, *Procedure for Pause/Stop Work*, for guidance.

5.4 FACILITY MANAGEMENT-SPECIFIC ACCESS REQUIREMENTS

TA-16 and TA-11 high explosives areas have specific access requirements. Access inside the security gate requires annual site-specific training. Curricula# 5243 must be assigned and all the training courses completed before arriving at TA-16.

For access to perimeter gates during normal working hours, contact MSS-UI at 665-0106.

For perimeter gates with key core MSS-UI, prior notification for after hours entry is required. Perform the following steps:

Step	Action
1	Call SOC Los Alamos at 667-4437.
2	Identify yourself to the on duty officer or attendant.
3	Provide the following information: Group, color and make of vehicle (s), which perimeter gate you are entering, and approximate time of arrival and finally, length of stay.

Failure to notify security personnel in advance could result in a security violation against the visiting Team Member.

Provide notification to SOC Los Alamos at 667-4437 when leaving area.

For access to WX areas requiring during normal working hours, perform the following steps:

- Ensure the required security clearance (Q clearance) is held, and
- Contact the FOD or designee for entry requirements.

5.4.1 CHEMISTRY METALLURGY RESEARCH FACILITY ACCESS

For access to the Chemistry Metallurgy Research Facility, perform the following:

- Must have the required Q clearance to pass the security gate.
- If access into any of the buildings is necessary, contact the FOD for an escort**.**
- If responding to an emergency with EO-EM, ENV-CP staff will be considered part of the EO-EM response team, met at the access gate, and escorted to the spill site.

5.4.2 TA-3-66 Sigma Facility Access

For access to the Sigma facility (TA-3-66), perform the following:

- For non-emergency responses, obtain prior site-specific training and authorization or contact the FOD for personnel escort.
- For emergency response with EO-EM, ENV-CP staff will be considered part of the EO-EM response team, met at the access gate, and escorted to the spill site.

5.5 Regulatory Spill Reporting

If a spill is determined to be a threat to the environment or human health, regulatory and DOE notification may be necessary. Contacts and telephone numbers can be found on Attachment 1, Release Notification Phone List.

If a Spill impacts a Solid Waste Management Unit (SWMU) or Area of Concern (AOC), contact ENV-CP and ADEP Corrective Action Program for possible additional notification requirements. See Attachment 1 to this document.

If ENV Division or designated SME personnel determine after a site inspection or verbal notification that a spill is non-reportable to DOE or applicable regulatory agencies, a non-reportable spill report must be completed by appropriate facility designated personnel. See attachment 2 for the spill report form and information to be collected. Once the form has been accurately completed it can be sent to the SME at ENV-CP for required documentation.

For ENV Division designated on-call personnel, follow guidance for spill reporting as described in ENV-DO-QP-101, *Environmental Reporting Requirements for Releases or Events*.

NOTE: On-call representatives are required to follow up in writing (email is sufficient) with the spills program lead regarding all releases during their on-call schedule. If no spills are reported in off-work hours, please confirm in writing with the spills program lead at the end of your on-call schedule.

For additional information concerning spill and unplanned discharge determination and notification requirements, contact the ENV-CP Water Quality Permitting and Compliance Team Leader.

6.0 REFERENCES

None

7.0 DEFINITIONS

Field Work: Performance of Laboratory related activities in areas that are removed or isolated from an established populated base of operation (that is, where emergency support and medical assistance is not readily available.)

NPDES: National Pollutant Discharge Elimination System

EO: Emergency Operations Division

EO-EM: Emergency Management Group (A.K.A. EO-3)

PRS: Potential Release Site

SOC Los Alamos: Security contractor for Los Alamos National Laboratory

SWMU: Solid Waste Management Unit

8.0 ATTACHMENTS

Attachment 1- ENV-CP Release Notification Phone List

Attachment 2- LANL Spill Report Form

By requesting credit for this required reading I acknowledge that I have read and understand the contents of this document and I will follow and meet the requirements in this document unless it is unsafe to do so.	Click to Acknowledge

ATTACHMENT 1- ENV-CP RELEASE NOTIFICATION PHONE LIST

Los Alamos National Laboratory
ENV-CP
Release notification phone list
March 2013

Los Alamos National Laboratory

(1)	Emergency Management (EO-EM)	667-6211
(2)	ENV-ES Group Office	665-885
(3)	ENV-CP Group Office	667-0666
(4)	ENV-DO	667-2211
(5)	Central Alarm Station	667-4437
	L.A. Fire Dept. dispatch	

New Mexico Environment Department
See Web address below

(1)	NMED Emergency Hotline	827-9329
(2)	NMED Non-Emergency Hotline	476-6000
(3)	Surface Water Quality Bureau	827-0187
	Erin Trujillo	827-0418
(4)	Ground Water Quality Bureau	827-2918
	Robert George	476-3648
	Jennifer Fullem	827-2909
(5)	NMED/HWB	
	Ruth Horowitz	476-6025

U.S Environmental Protection Agency

(1)	USEPA Emergency Hotline	(214) 655-6450
	After Work Hours	(214) 655-6595
(2)	Jan Walker (214) 655-8431	

U.S. Department of Energy

(1)	Gene Turner	667-5794

State Emergency Response Commission (SERC) Notification

New Mexico State Police (Immediate Notification)	(505) 827-9126 (24-hour #)
State and Local Preparedness Bureau (Follow-up Notification)	(505) 476-9600 (daytime # only)

National Response Center

U.S. Coast Guard 1-800-424-8802
See NRC web address below for report form

New Mexico State Police

New Mexico State Police — 1-800-827-9126 (24 hr. #) or
827-9300 (dispatch, 24 hr. #)

Local Emergency Planning Committee (LEPC) LAPD

Philmont Taylor — (505) 663-3511

On Call Environmental Contact for Releases
Group Representatives for Notifications to External Agencies

Name	Group	Work Phone	Pager	Cellular Phone	Email address
Jake Meadows	ENV-CP	606-0185	664-1333	231-0460	jmeadows@lanl.gov
Mike Saladen	ENV-CP	665-6085	664-4226	699-1284	saladen@lanl.gov
Mark Haagenstad	WM-WMP	665-2014	664-5356	699-1733	mph@lanl.gov
Tim Zimmerly	ENV-CP	664-0105	699-7621	664-1237	tzimmer@lanl.gov
Terrill Lemke	ENV-CP	665-2397	664-7082	699-0725	tlemke@lanl.gov

Web addresses:
NMED home page http://www.nmenv.state.nm.us
National Response Center home page http:/www.nrc.uscg.mil/nrchp.html
Reportable Quantities web page http://homer.ornl.gov/rq/

ATTACHMENT 2- LANL SPILL REPORT FORM

LANL SPILL REPORT

Environmental Protection Division (ENV)
Compliance Programs Group (CP)
Los Alamos National Laboratory

Spill Coordinator	Telephone	Mail Stop	Division	Group
Responsible Facility/User Group				
Contact Person	Telephone	Mail Stop	Pager #	

Spill Location		Date of Spill	Time of Spill	Date Discovered	Time Discovered
Date Spill Stopped	Time Spill Stopped	Method used to Stop Spill			

Actions taken to Mitigate Damage

Nearest Water Course Affected? ☐ Yes ☐No ☐ NA *(If yes, please describe.)*

Source and Cause of Spill *(pipeline, tank, truck, overflow, etc.)*

Materials Spilled

Estimated Amount of Material Spilled

Cleanup Started? ☐ Yes ☐ No	Date Started	Time Started	
Cleanup Finished? ☐ Yes ☐ No	Date Finished	Time Finished	

Cleanup Method

Weather Conditions

Comments

Estimate the quantity of waste generated by the spill cleanup procedures, how that waste is packaged and the current disposition of wastes.
Describe any sampling performed during spill cleanup and attach analytical results to this form.
Describe current status of the spill site and the need for further cleanup or monitoring activities.
Describe actions taken to prevent recurrence of such a spill.
Injuries or Exposure? ☐ Yes ☐ No *(If yes, please describe.)*

Did evacuation occur? ☐ Yes ☐ No	Were facilities or equipment damaged? ☐ Yes ☐ No
Did fire/explosion occur? ☐ Yes ☐ No	Was there a potential for fire/explosion? ☐ Yes ☐ No

Did the spill enter sewer drains, streams, or stream beds? ☐ Yes ☐ No *(If yes, give location and ultimate drainage.)*
Who discovered the Spill?

Spill Information

Describe the spill response, in chronological order. Include a call-out response personnel, steps taken to contain the spill, and steps taken to clean it up. Also describe spill control equipment used.

Additional Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of certifying official:	Title:	Organization:	Date signed:

ENV-CP-QP-045.1		
Effective Date: September 5, 2013	Next Review Date: August 5, 2015	Los Alamos NATIONAL LABORATORY EST.1943

Environment, Safety, Health Directorate

Environmental Protection – Compliance Programs Quality Procedure

Installing, Setting Up, and Operating ISCO Samplers for the MSGP

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ADESH-OIO, QA Specialist	Signature on file	8/28/13

Derivative Classifier: ☐ **Unclassified** ☒ **DUSA ENVPRO**

Name:	Organization:	Signature:	Date:
Ellena Martinez	ADESH-OIO	Signature on file	8/28/13

Approval Signatures:

Subject Matter Expert: Holly Wheeler	Organization: ENV-CP	Signature: Signature on file	Date: 8/29/13
Responsible Line Manager: Michael Saladen	Organization: ENV-CP Team Lead	Signature: Signature on file	Date: 8/29/13
Responsible Line Manager: Anthony Grieggs	Organization: ENV-CP Group Leader	Signature: Signature on file	Date: 9/5/13

CONTROLLED DOCUMENT

This copy is uncontrolled. The controlled copy can be found on the ENV Division Web page.

Users are responsible for ensuring they work to the latest approved version.

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	03/11	New Document.
1	04/13	Biennial Review and Revision
2	09/13	Biennial Review and Revision

Table of Contents

1.0 PURPOSE

This procedure describes the installation, setup, programming, and operation of Teledyne ISCO Avalanche and Model 3700 full-size portable automated samplers used to collect storm water runoff samples for the Multi-Sector General Permit (MSGP).

2.0 SCOPE

This procedure applies to all ENV-CP technical staff and contractor personnel conducting installation, operation, maintenance and sampling activities at single stage stations used for monitoring under the MSGP.

2.1 HAZARD REVIEW

Hazards in the work described in this procedure are controlled thorough site specific IWDs. The hazard level of the activities in this procedure is **moderate**.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- This procedure applies to all ENV-CP MSGP storm water compliance personnel conducting installation, operation, maintenance and sampling activities at MSGP single stage monitoring stations.

The training method for this procedure is "self-study" (reading). For ENV-CP staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

Personnel performing this procedure will be familiar with the most current versions of the following procedures and operation manuals:

- ENV-CP MSGP Sampling and Analysis Plan for the current monitoring year
- Manual for Teledyne ISCO Sampler Model 3700.
- Manual for Teledyne ISCO Avalanche refrigerated sampler
- Facility/FOD specific IWDs for the MSGP

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are generated as a result of this procedure and are maintained in accordance with ENV-DO-QP-110, *Records Management Program* with the originals on file at ENV-CP offices:

Completed work orders for:

- LANL MSGP ISCO Sampler Installation Form 045-1(Attachment 1)
- LANL MSGP ISCO Sampler Activation Form 045-3 (Attachment 6)
- LANL MSGP ISCO Sampler Winter Shutdown 045-5 (Attachment 9)
- LANL MSGP ISCO Sampler Decommission 045-6 (Attachment 10)

5.0 WORK PROCESSES

The discharge of storm water from industrial facilities at Los Alamos National Laboratory (LANL, the Laboratory) is regulated under the National Pollutant Discharge Elimination System (NPDES) *Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity* (MSGP). The current MSGP became effective on September 29, 2008 pursuant to 73 FR 56572. The Laboratory's MSGP permit coverage (Permit Tracking No. NMR05GB21) requires storm water quality monitoring to evaluate the overall effectiveness of control measures. ISCO samplers coupled with Model 1640 sampler actuators are used at MSGP Program monitoring stations. Refrigerated (Avalanche) and/or non-refrigerated (Model 3700) samplers may be deployed; and may be configured with multi-battery arrays, solar panels, and surge protectors.

5.1 Equipment and Tools

Ensure the following equipment is available in the field vehicle:

- Copy of this procedure
- Copy of the appropriate Integrated Work Document(s) (IWDs)
- Charged spare battery(ies)
- Battery voltage tester
- Spare tubing (pump, suction, discharge types, sampler specific)
- Spare sample bottles
- Shovels
- Wooden stakes
- Plastic wire "zip" ties
- Cell phone (only government cell phones with the battery removed are allowed in secure areas)
- Appropriate tools (including insulated tools for electrical work) in tool box
- Issued Work Orders and associated forms
- Necessary access and station keys
- Ziploc® plastic storage bags
- Tape measure
- Sturdy hiking boots or steel toed shoes with soles that grip

The time on the ISCO sampler clock must be verified upon arrival at the site. The ISCO clocks must be set to Mountain Standard Time (MST) at all times, with no daylight saving time adjustment. Cellular phones can be used to verify the time.

5.2 ISCO Sampler Installation

Step	Action
1	Work Orders are issued for all field operations at individual MSGP monitored outfalls. Obtain the Work Order with the LANL MSGP ISCO Sampler Installation Form 045-1 (Attachment 1). The Work Order specifies the MSGP outfall and target date for the work to be performed. An outfall-specific equipment list with specifications and configuration settings is provided on each Work Order.
2	Deploy the ISCO sampler and charged battery on level ground above the flood plain. Often, large tool/storage boxes (Greenlee™) are used for equipment protection in the field. **NOTE:** These boxes are locked. Therefore, a key should be obtained prior to accessing them. The sampler should be as level as possible to allow effective sample collection. Verify/record the ISCO sampler serial number and the battery tracking number(s) on the Work Order.
3	Install the separate protective battery box for the charged battery (follow manufacturer's instructions).
4	Determine the bottle set configuration from the equipment list on the Work Order. • If a Model 3700 sampler is indicated, install the correct distributor arm (has either "12" or "24" embossed on bottom at outlet). • For an Avalanche sampler, attach either the discharge tube guide (single bottle configuration) or the distributor arm (multi-bottle configuration) and the appropriate bottle adapter plate. If an adapter plate is not available, the inside of the sampler may need to be configured by hand (i.e., add form) to prevent bottles from moving around during a sampling event. • Install required bottles and retaining devices in the sampler base. • Check that the end of the discharge tubing does not extend below the bottom face of the distributor arm (where it could snag the bottle tops and jam as the arm advances through the bottle sequence). • Remove and place the clean bottle caps in a new Ziploc® plastic bag.
5	Attach a length (in whole foot increments) of 3/8-inch diameter Teflon suction line to the sampler intake line and anchor as needed for the Outfall location. Measure and record (for later programming steps) the tubing length used. Route the sample tubing downslope from the sampler to the intake point so that there is a continuous slope with no valleys that could retain water between sample intervals.
6	Install the actuator: • Anchor a stake to the channel bottom in the main flow of the outfall discharge. • Attach the sampler intake tube and the 1640 liquid level detector (actuator) to the stake. • Position the actuator at least ½ inch above the intake tube to ensure there is enough water to submerge the intake when the sampler is activated. • Connect the actuator to the sampler using the cable connector provided by the manufacturer. • If necessary, use a gravel bag to create a small pooling area for the actuator and sampler intake to sit in. The actuator height above the channel bottom is established using professional judgment. For example, the intake may be positioned 1 inch or less above the bottom of low-flowing wide channels, but higher than 1 inch in a high-flowing narrow channel.

7	**NOTE:** You must be a trained electrical worker and have completed all required courses in Training Plan #2876 to conduct this step. Connect the sampler to the power source, either a 12 Volt 110 A-h deep cycle lead acid battery or other power source such as a multi-battery array coupled with a solar panel, as appropriate. Record the battery tracking numbers in the equipment list section of the Work Order. (Refer to Attachments 2 and 3 for the wiring diagram for Avalanche sampler installation.)

5.3 CONFIGURING ISCO 3700 SAMPLERS

Step	Action
1	When a new ISCO 3700 sampler is being installed, configure the sampler in accordance with the steps contained in this section. Follow the project-specific configuration settings as indicated on the Work Order and given in Attachment 4, ISCO 3700 Configuration Settings.
2	Turn on the sampler by pressing the “On” button.
3	Press the “Enter/Program” button.
4	Select “Configuration”.
5	Set the configuration parameters in accordance with the guidance in Attachment 4, ISCO 3700 Configuration Settings. After each selection is made, press the “Enter” button to allow the next configuration parameter to be displayed on the screen.
6	After the programming is complete, select “Run diagnostics” and press “Enter” to run the system diagnostic test. The diagnostic tests include the following: • RAM and ROM test • LCD test • Pump test (“OFF/ON” number should be between 50 and 200 for a successful test) • Distributor test -- select “YES” to run test. Test will move the distributor to Position 24 and then return it to Position 1.
7	Following the diagnostic tests, “Reinitialize Controller” will be displayed. Select “No” and press “Enter.” <u>Do not select “Yes.”</u> If “Yes” is selected, the sampler will reset a number of configuration and program settings to the factory default values.
8	To leave the configuration sequence, use the “Exit configuration” and press “Yes” or press the “Enter/Program” key.

5.4 PROGRAMMING ISCO 3700 SAMPLERS

Step	Action
1	Follow the steps in this process to program a new ISCO or to confirm the program settings are correct for a specific location. Follow the project-specific program settings as indicated on the

	work order and given in Attachment 5, ISCO 3700 Program Sequence.
2	Turn on the sampler by pressing the “ON” button
3	Press the “Enter/Program” button.
4	Select “Program”.
5	Set the program parameters in accordance with the guidance on Attachment 5, ISCO 3700 Program Sequence. After each selection is made, press the “Enter” button to allow the next configuration parameter to be displayed on the screen.
6	Set the switch on the actuator to “Latch.”
7	**NOTE:** You must be a trained electrical worker and have completed all required courses in Training Plan #2876 to conduct this step.
8	Complete the responses for the sampler installation tasks listed on the Work Order. Sign and date the Work Order and ensure all items contained within it have been completed.

5.5 ACTIVATING ISCO 3700 SAMPLERS

Step	Action
1	Follow the steps in this section when a Work Order is received to activate a sampler (generally at the beginning of a field season or at the beginning of the next quarter after the last quarterly monitoring sample was obtained). Note: The MSGP monitoring quarters are as follows • April 1 through May 31 • June 1 through July 31 • August 1 through September 30, and • October 1, through November 30.
2	Obtain the Work Order with the LANL MSGP Sampler Activation Form 045-3 (Attachment 6). The Work Order specifies the MSGP Outfall and target date for the work to be performed. An Outfall-specific equipment list with specifications and configuration settings is provided on each Work Order. **NOTE:** You must be a trained electrical worker and have completed all required courses in Training Plan #2876 to conduct this step. If not already installed, install and hook up the charged battery. If a battery is already in place, use the voltage tester to check for minimum voltage of 11.7 volts. If the voltage is lower, replace the battery with a charged battery.
3	Turn the sampler ON. “Program halted” will be displayed; press the Enter/Program button to enter program/configure sequence.
4	Check the configuration and programming parameters to ensure they are still correct for the specific installation (see Attachment 4 and 5 for the correct parameters).
5	Check integrity and condition of sampler tubing, actuator, wiring, etc., to ensure sampler will properly collect a sample.

6	To test the integrity of the tubing, press “Pump forward” to turn on pump and test for suction at the tubing intake. Press “Stop” to turn off pump. If no suction is felt at the intake, check the integrity of the tubing and replace as necessary.
7	To activate the sampler, press “Start sampling” and “Enter” twice.
8	Ensure the sampler indicates “Sampler Inhibited”.
9	Complete the responses for the sampler activation tasks listed on the Work Order. Sign and date the Work Order and ensure all items contained within it have been completed.

5.6 CONFIGURING ISCO AVALANCHE SAMPLERS

Step	**Action**
1	When a new ISCO Avalanche sampler is being installed, configure the sampler in accordance with the steps contained in this section. Follow the project-specific configuration settings as indicated on the work order and given in Attachment 8, ISCO Avalanche Configuration Settings.
2	Turn on the sampler by pressing the “Standby” key.
3	From the main menu, select Other Functions, to access the menus and select options given in Attachment 8.
4	Set the configuration parameters in accordance with the guidance on Attachment 8, ISCO Avalanche Configuration Settings.
5	After the programming is complete, select “Run diagnostics” and press “Enter” to run the system diagnostic test. These include the following: • RAM and ROM test • Pump test (“ON/OFF” ratio should be between 0.80 and 1.25 for a successful test) • Distributor test -- select “YES” to run test. Test will move the distributor to Position 14 and then return it to Position 1.
6	Following the diagnostic tests, “Reinitialize Controller” will be displayed. Select “No” and press the “Enter” key. (If “Yes” is selected, the sampler will reset a number of configuration and program settings to the factory default values).
7	If a 700 series module (e.g., pH) is to be installed, consult the equipment manufacturer’s manual for installation instructions. **NOTE:** The pH module is only required at the Asphalt Batch Plant.
8	Complete the responses for the sampler installation tasks listed on the Work Order. Sign and date the Work Order and ensure all items contained within it have been completed.

5.7 PROGRAMMING ISCO AVALANCHE SAMPLERS

Step	Action
1	Follow the steps in this process to program a new ISCO or to confirm the program settings are correct for a specific location and bottle configuration. Follow the project-specific program settings as indicated on the work order and given in Attachment 8, ISCO Avalanche Program Sequence.
2	Turn on the sampler by pressing the “Standby” key.
3	Press the “Program” button.
4	Select the current program to review settings, or choose “Select New Program” to create a new program with different settings.
5	Select the current program to review settings, or choose “Select New Program” to create a new program with different settings.
6	At the prompt “Programming complete, run this program now?” , select “Yes” if sampler is scheduled to be active, and “No” if sampler is in stand down.
7	Set switch on actuator to “Latch.”
8	Complete the responses for the sampler installation tasks listed on the Work Order. Sign and date the Work Order and ensure all items within it have been completed.

5.8 ACTIVATING ISCO AVALANCHE SAMPLERS

Step	Action
1	Follow the steps in this section when a Work Order is received to activate a sampler (generally at the beginning of a field season or at the beginning of the next quarter after the last quarterly monitoring sample was obtained). Note: The MSGP monitoring quarters are as follows • April 1 through May 31 • June 1 through July 31 • August 1 through September 30, and • October 1, through November 30.
2	**NOTE:** You must be a trained electrical worker and have completed all required courses in Training Plan #2876 to conduct this step. If not already installed, install and hook up the charged battery(ies). If a battery is already in place, use the voltage tester to check for minimum voltage of 11.7 volts. If the voltage is lower, replace the battery with a charged battery.
3	Turn on sampler power. From the main menu, select “Program” and the “Enter” key to enter programming sequence, and “Other Functions” to enter the configuration settings.
4	Check the programming/configuration parameters to ensure they are still correct for the specific installation – follow the two preceding sections for the steps and see Attachment 7 and 8 for the correct parameters.
5	Check integrity and condition of sampling tubes, actuator, wiring, etc., to ensure sampler

	will properly collect a sample.
6	From the main menu, select “Other Functions” ►“Manual Functions” ►“Operate Pump” to perform a manual suction test. To test the integrity of the tubing, press “Pump forward” to turn on pump and test for suction at the tubing intake. Press “Stop” to turn off pump. If no suction is felt at the intake, check the integrity of the tubing and replace as necessary.
7	Reset the actuator by toggling the switch to “Reset” then back to “Latch.” To activate the sampler, ensure the correct program name is displayed on the main menu and select “Run”.
8	Ensure the sampler indicates “Program Disabled”.
9	Note: The Avalanche refrigeration system is active any time the controller is powered. This is true for all states (including OFF), except for the time between entering RUN and the completion of the first sample, and when the pump is running. To conserve power, the Avalanche assumes that during this time there is no sample liquid to cool.
10	Ensure that all items on the Work Order have been completed.

5.9 Standing Down or Winterizing Samplers

Step	Action
1	Follow the steps in this section when a Work Order is received to turn off (“stand down”) a sampler (generally at the end of a field season, which is November 30, or to disable a sampler for a certain time period after a sample was collected). Fill out the LANL MSGP ISCO Sampler Winter Shut-Down Form in Attachment 9.
2	ISCO 3700: Turn off power. ISCO Avalanche: The Avalanche refrigeration system is active any time the controller is powered. This is true for all states (including OFF), except for the time between entering RUN and the completion of the first sample, and when the pump is running. To conserve power, the Avalanche assumes that during this time there is no sample liquid to cool. **NOTE:** To ensure that the refrigeration system does not activate during an intended stand down, disconnect the sampler from the power source.
3	Remove the battery and return it to the storage compound at TA-64 or other specified location identified by ENV-CP MSGP stormwater compliance personnel. Store cables inside the Greenlee™ box. If the actuator and tubing are not contained within conduit, disconnect these and place them in the box. Close sampler. Avalanche samplers must not be left in place for the winter, and are required to be returned to ENV-CP’s storage shed.
4	Ensure that all items on the Work Order have been completed.

5.10 Sampler Reset and Re-initialization After Sample Collection

Step	Action
1	Follow ENV-CP-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP* for collecting samples from an ISCO and installing new bottles so it is ready to collect new samples.
2	After collecting samples and resetting the sampler, follow instructions on sample collection Work Order, the updated sample tracking log or confer with the MSGP Project Lead regarding whether the sampler should be disabled. If sampler is to be deactivated, follow the steps specific to each sampler provided in the preceding section. If an ISCO 3700 sampler is to be left activated, reset the actuator by toggling the switch to "Reset" then back to "Latch", and press "Start sampling" and "Enter" twice. Ensure the sampler display indicates "Sampler Inhibited": If an ISCO Avalanche sampler is to be left activated, reset the actuator by toggling the switch to "Reset" then back to "Latch." From the main menu, verify the correct program name is displayed and select "Run." Ensure the sampler display indicates "Program Disabled."

5.11 Removing a Sampler

Step	Action
1	Follow the steps in this process when a Work Order is received to un-install or remove a sampler. Fill out the LANL MSGP ISCO Sampler Decommission Form in Attachment 10.
2	Disconnect all equipment and remove it from the site. Return the equipment to the ENV-CP Storage Shed or other location specified by MSGP storm water compliance personnel.
3	Dispose of all equipment components that contacted samples (tubing, bottles, etc.) as waste according to applicable waste management procedure. For assistance, contact the Waste Management Coordinator for TA-59.
4	Ensure that all items on the Work Order have been completed.

6.0 REFERENCES

ENV-DO-QP-110, *Records Management Program*

ENV-DO-QP-115, *Personnel Training*

ENV-CP-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP*

7.0 DEFINITIONS

ENV-CP: Environmental Protection Division, Compliance Programs Group

Grab Sample: A single sample collected at an NPDES outfall (using approved EPA methods) at a particular time that represents the composition of the storm water at that time and place.

IWD: Integrated Work Document

MSGP: Multi-Sector General Permit

MST: Mountain Standard Time

NPDES: National Pollutant Discharge Elimination System

8.0 ATTACHMENTS

Attachment 1- LANL MSGP ISCO Sampler Installation Form 045-1

Attachment 2- Wiring Diagram for Avalanche Sampler

Attachment 3 – Battery Photovoltaic Connection Wiring

Attachment 4 - ISCO 3700 Configuration Settings

Attachment 5 – ISCO 3700 Program Sequence

Attachment 6 – LANL MSGP ISCO Sampler Activation Form 045-3

Attachment 7 – ISCO Avalanche Configuration Settings

Attachment 8 – ISCO Avalanche Program Sequence

Attachment 9 – LANL MSGP ISCO Sampler Winter Shut-Down Form 045-5

Attachment 10 – LANL MSGP ISCO Sampler Decommission Form 045-6

ATTACHMENT 1- LANL MSGP ISCO SAMPLER INSTALLATION FORM 045-1

ENV-QP-045.0 | **LANL Multi-Sector General Permit**
ISCO Sampler Installation Form | Form 045-1 (3/2011)

Outfall: **54-G-4 : 54-PAD10E** | Project ID: **P-MSGP-2443** | Work Order ID: **MSGP-31193**

Target Date: **4/1/2013**

Project: MSGP 2013 Sampler Install

Reason: MSGP 2013 Sampler Installation

Date:____________________ Time:__________________

Name/Z#:____

Name/Z#:____

Lead Signature:___________________________________

"I confirm the information as recorded is true, accurate and complete."

Verify the equipment list below. Make corrections as required and fill in missing information (e.g., serial numbers).

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640	210J01660		
Charge Controller	Xantrex	C-12	B20037667		
ISCO 3700 Sampler	Teledyne	3700	198H00978	Bottle Set	12c- 1 1L Glass, 11 1L Poly
ISCO 3700 Sampler	Teledyne	3700	198H00978	Program	Time / Multiplex no delay
ISCO Avalanche Sampler	Teledyne	Avalanche	210J00066	Bottle Set	14 950 mL Poly
ISCO Avalanche Sampler	Teledyne	Avalanche	210J00066	Program	1-Part, 14 Bottles, 950 mL
Pb-Acid Battery	Universal	110 A-h	MSGP-110-0311-07	Voltage	> 11.7 V
Pb-Acid Battery	Universal	110 A-h	MSGP-110-0311-08	Voltage	> 11.7 V
Pb-Acid Battery	Universal	110 A-h	MSGP-110-0311-09	Voltage	> 11.7 V
Solar Panel	SunWize	SW-S85P	11004467		

ISCO Sampler Tasks		Note: If "No" provide correct information or explanation.
Deploy battery(ies) if not listed in equipment list above. Record serial numbers of battery(ies) installed.	❒Yes ❒No	
Deploy Avalanche sampler matching serial number listed in equipment list above for installation.	❒Yes ❒No	
Deploy and install pH and Temperature Probe listed in equipment list above and probe saturation resevior.	❒Yes ❒No	
Refer to the wiring diagram in ENV-QP-045.0 for the solar panel, battery configuration, and type of sampler being installed. Has wiring been completed according to instructions?	❒Yes ❒No	
Is the sampler installed according to steps in ENV-QP-045.0?	❒Yes ❒No	
Is a Greenlee box used?	❒Yes ❒No	
Are electrical connections secure?	❒Yes ❒No	
Record battery voltage(s). Voltage(s) > 11.7 V ?	❒Yes ❒No	
Is the sampler physically configured for the types and number of bottles specified above (i.e., correct carousel, base, arm)?	❒Yes ❒No	
Is the sampler programmed correctly per ENV-QP-045.0 for the program / bottle set specified above?	❒Yes ❒No	
Does sampler pass the ISCO diagnostics test ?	❒Yes ❒No	
Does sample tubing pass suction test?	❒Yes ❒No	
Is sampler ON upon departure?	❒Yes ❒No	
Does ISCO display either "Sampler Inhibited" or "Program Disabled"?	❒Yes ❒No	
Has the actuator switch been reset to "Latch"?	❒Yes ❒No	
If any maintenance completed, check YES and describe.	❒Yes ❒No	
If any follow-on maintenance is required, check YES and describe.	❒Yes ❒No	

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted	Tech QC	ENV-RCRA Review
______________	______________	______________

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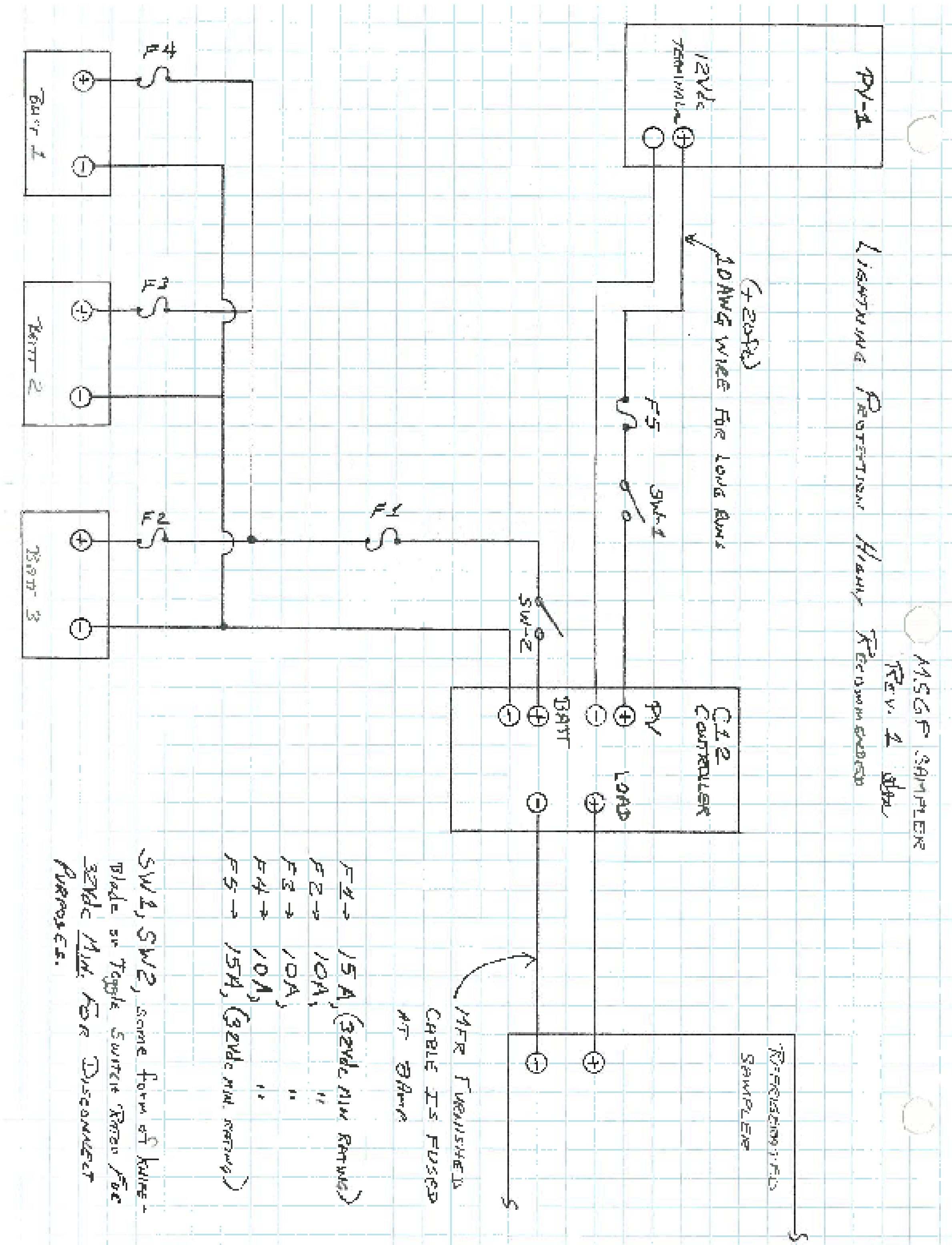
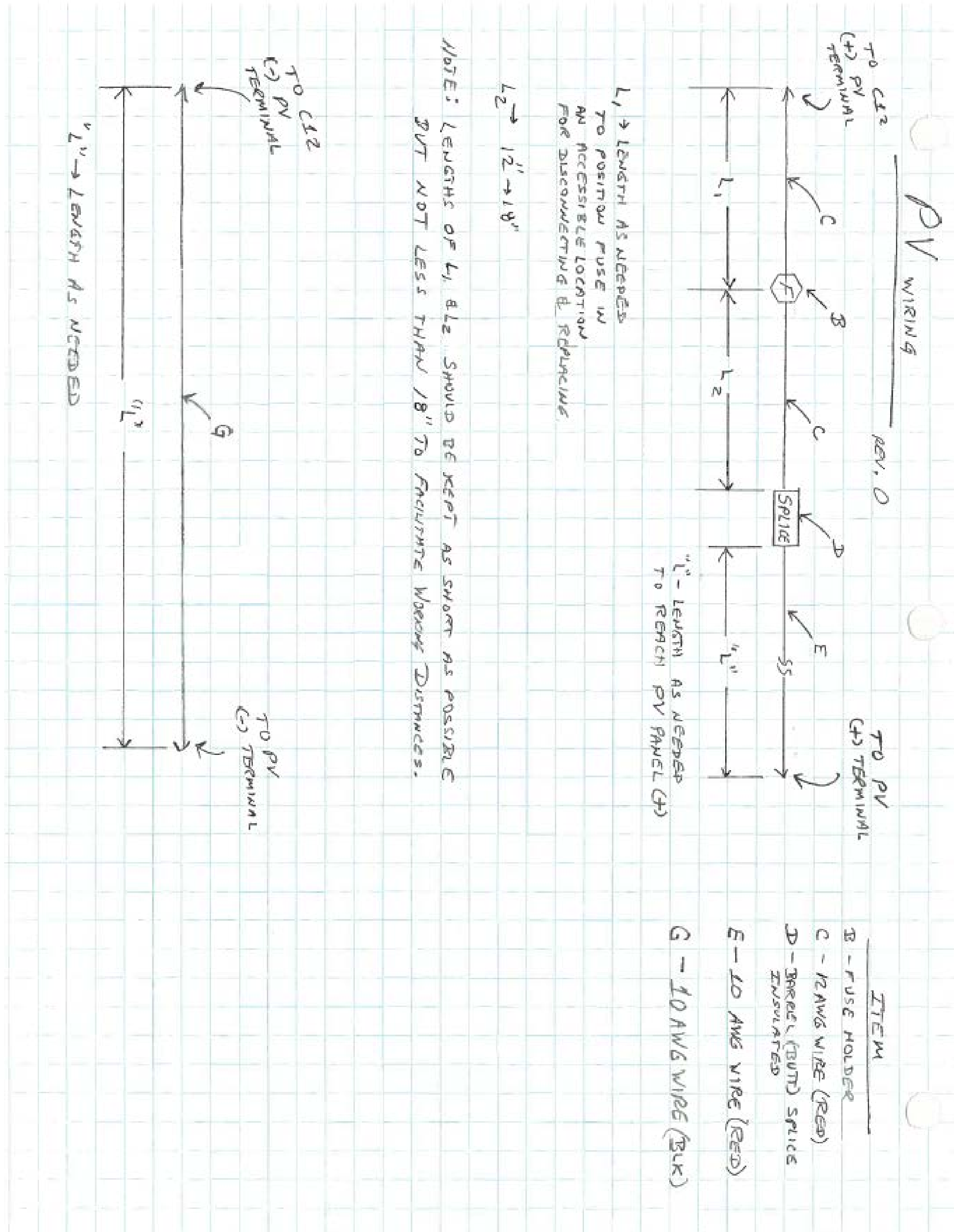
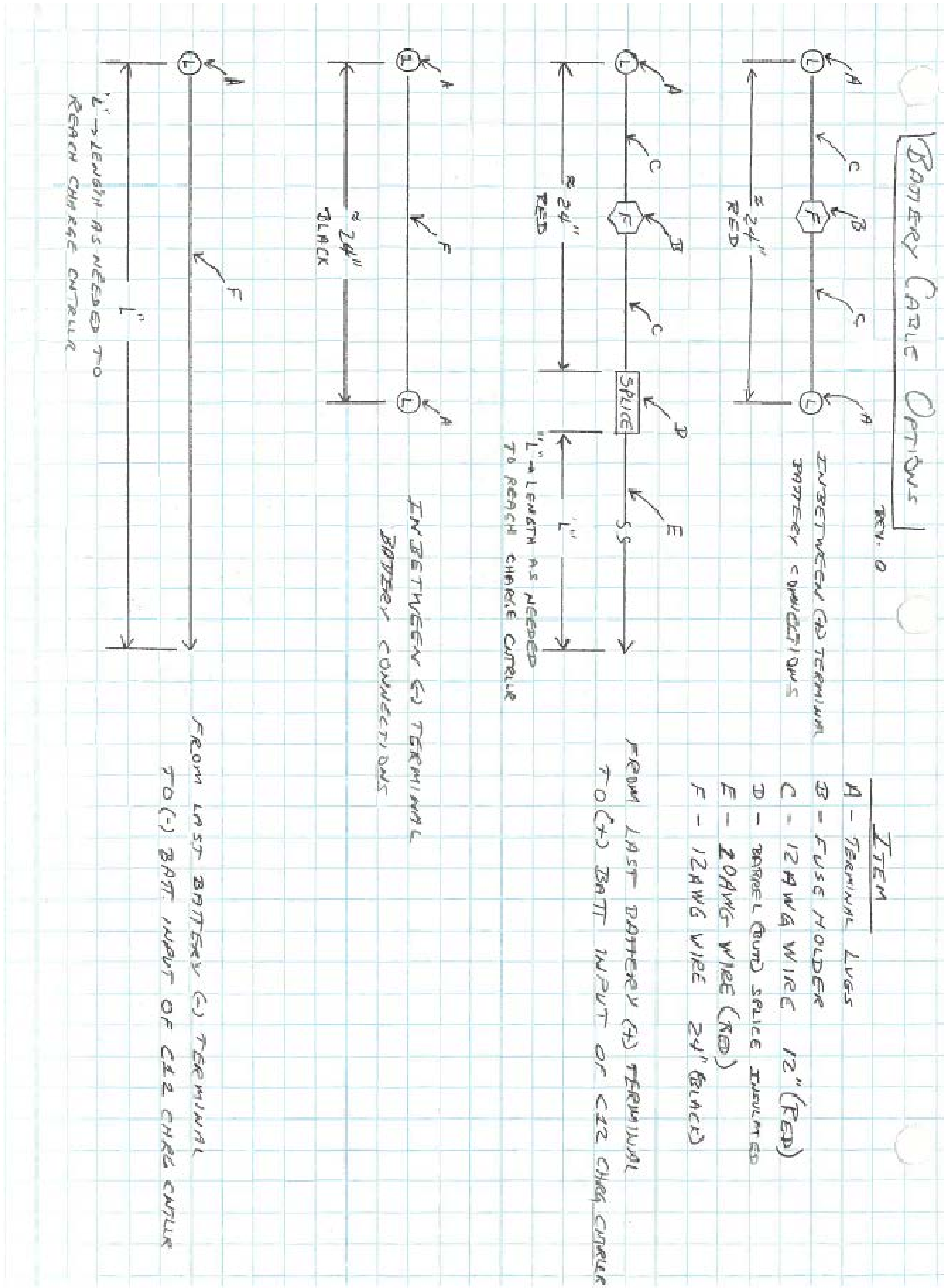
ATTACHMENT 2- WIRING DIAGRAM FOR AVALANCHE SAMPLER



ATTACHMENT 3 – BATTERY PHOTOVOLTAIC CONNECTION WIRING





BATTERY CABLE OPTIONS
REV. 0
ITEM
A - TERMINAL LUGS
B = FUSE HOLDER
C = 12AWG WIRE 12" (RED)
D - BARREL (BUTT) SPLICE INSULATED
E - 10AWG WIRE (RED)
F - 12AWG WIRE 24" (BLACK)
INBETWEEN (+) TERMINAL BATTERY CONNECTIONS
≈ 24" RED
SPLICE
"L" → LENGTH AS NEEDED TO REACH CHARGE CNTRLLR
FROM LAST BATTERY (+) TERMINAL TO (+) BATT INPUT OF C12 CHRG CNTRLLR
INBETWEEN (-) TERMINAL BATTERY CONNECTIONS
≈ 24" BLACK
FROM LAST BATTERY (-) TERMINAL TO (-) BATT. INPUT OF C12 CHRG CNTLLR
"L" → LENGTH AS NEEDED TO REACH CHARGE CNTRLLR

ATTACHMENT 4 - ISCO 3700 CONFIGURATION SETTINGS

Parameter	Storm sampling with multiplex, timed delay	Time sampling with multiplex	Flow sampling with multiplex
Time/ Date	[Set to MST]	[Set to MST]	[Set to MST]
Portable/ Refrig	Portable	Portable	Portable
Bottles	12 or 24	12 or 24	12 or 24
Bottle volume	950 ml	1000 ml	1000 ml
Suction line diameter	3/8 inch	3/8 inch	3/8 inch
Suction line type	Teflon	Teflon	Teflon
Suction line length	X feet	X feet	X feet
Liquid detector	Enable	Enable	Enable
Rinse cycles	0	1	1
Enter Head Manually	No	Yes	Yes
Retry	1	1	1
Program mode	Extended	Basic	Basic
Load program	None	N/A	N/A
Save program as	None	N/A	N/A
Take sample at start time	No	N/A	N/A
Take sample at time switch	No	N/A	N/A
Enter intervals in minutes	1 minute	N/A	N/A
Calibrate sampler	Disable	Enable	Enable
Sampling stop/resume	Disable	N/A	N/A
Start time delay	0 minutes	0 minutes	0 minutes
Master slave	No	No	No
Sample upon Disable	No	No	No
Sample upon enable	No	Yes	Yes
Reset sample interval	Yes	Yes	No
Inhibit countdown	Yes	Yes	No
Event marker	Pulse	Pulse	Pulse
At the beginning of:	Purge	Purge	Purge
Purge counts presample counts	150	100	100
Post sample counts	394	1000	1000
Pump counts	[500,000]	[500,000]	[500,000]
Reset pump counter	No	No	No
Pump counts to warning	500,000	500,000	500,000
Program lock	Disable	Disable	Disable
Sampler ID number is:	[leave blank]	[leave blank]	[leave blank]
Run diagnostics	Yes	Yes	Yes
Test distributor	Yes	Yes	Yes
Re-initialize	No	No	No

ATTACHMENT 5 – ISCO 3700 PROGRAM SEQUENCE

Parameter	Storm sampling with multiplex, timed delay
[Switch on liquid actuator]	Set to "Latch"
Paced sampling	Storm
Time Mode 1st Bottle Group	X-minute delay
Timed Sample Event	1
Bottle per sample event	11 or 23
Sample volume	950 ml
Bottles available	1
2nd bottle group	Time
2nd group samples	1-minute delay
Sample interval	1 minute
Bottles per sampling event	1
Sample per bottle	1
Sample volume	950 ml
Enter start time	No

[Programming complete]

Parameter	Time sampling with multiplex
[Switch on liquid actuator]	Set to "Latch"
Time/Flow	Time
Min/Hr	1 min
Multiplex samples	Yes
Bottles/sample or Samples/Bottle	Bottles/ sample
Number of bottles	12 or 24
Sample volume	1000 ml
Suction head	XX Ft
Calibrate sample vol	No
Enter start time	No

[Programming complete]

Avalanche Program Sequence, cont.

Parameter	Time sampling, single bottle composite sample	Time sampling, 1-part program	Time sampling, 2-part program
Two-Part Program			
Part A	N/A	N/A	Yes
Assign bottle	N/A	N/A	1-X of 4 or 14
Pacing	N/A	N/A	Uniform time paced
Time between samples	N/A	N/A	1 minute
Distribution	N/A	N/A	Sequential
Bottles per event	N/A	N/A	1
Switch bottles on	N/A	N/A	Number of samples
Switch bottles every X samples	N/A	N/A	1
Run continuously	N/A	N/A	No
Sample volumes dependent on flow?	N/A	N/A	No
Sample volume	N/A	N/A	Select between 10 ml and full container volume
Enable programmed	N/A	N/A	None
Once enabled, stay enabled	N/A	N/A	Yes
Sample at enable	N/A	N/A	Yes
Sample at disable	N/A	N/A	No
Pauses and resumes	N/A	N/A	0
Part B	N/A	N/A	Yes
Pacing	N/A		Uniform time paced
Time between sample events	N/A	N/A	1 minute
Distribution	N/A	N/A	Sequential
Bottles per event	N/A	N/A	1
Switch bottles on	N/A	N/A	Number of samples
Switch bottles every X samples	N/A	N/A	1
Run continuously	N/A	N/A	No
Sample volumes dependent on flow?	N/A	N/A	No
Sample volume	N/A	N/A	Select between 10 ml and full container volume
Enable programmed	N/A	N/A	No

Avalanche Program Sequence, cont.

Parameter	**Time sampling, single bottle composite sample**	**Time sampling, 1-part program**	**Time sampling, 2-part program**
Once enabled, stay enabled	N/A	N/A	Yes
Sample at disable	N/A	N/A	No
Sample at enable	N/A	N/A	Yes
Once enabled, stay enabled	N/A	N/A	Yes
Pauses and resumes	N/A	N/A	0
Delay to start	N/A	N/A	No
Reset Sampler			
Switch on liquid actuator	Toggle to “Reset” then back to “Latch”	Toggle to “Reset” then back to “Latch”	Toggle to “Reset” then back to “Latch”
Select Program name	Run	Run	Run

ATTACHMENT 6 – LANL MSGP ISCO SAMPLER ACTIVATION FORM 045-3

ENV-QP-045.0

LANL Multi-Sector General Permit
ISCO Sampler Activation Form

Form 045-3 (3/2011)

Outfall: **3-PSP-5 : E121.9-ISCO 12** Project ID: **P-MSGP-830** Work Order ID: **MSGP-12785**

Target Date: **4/11/2011**

Project: MSGP Sampler Activation Q1 2011

Reason: MSGP Sampler Activation 2011 Q1

Date:________________ Time:____________

Name/Z#:____________________________

Name/Z#:____________________________

Lead Signature:__________________________

"I confirm the information as recorded is true, accurate and complete."

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640		Actuator Height	
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Bottle Set	12c- 1 1L Poly
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Program	Time / Multiplex no delay
Pb-Acid Battery				Voltage	> 11.7 V

ISCO Sampler Tasks	Note: If "No" provide correct information or explanation.	
Is the ISCO time delta < 1 min (MST)? If no, record adjustment.	❐Yes ❐No	
Does sampler pass the ISCO diagnostics test?	❐Yes ❐No	
Are electrical connections secure?	❐Yes ❐No	
Record battery voltage(s). Is/are voltage(s) > 11.7 V?	❐Yes ❐No	
Does ISCO display either "Bottle 1 of X afer 1" or "Sampler Inhibited"?	❐Yes ❐No	
Is bottle set described above installed?	❐Yes ❐No	
Is recorded height of actuator above channel bottom correct?	❐Yes ❐No	
If any maintenance completed, check Yes: Describe.	❐Yes ❐No	
If any follow-on maintenance is required, check Yes: Describe.	❐Yes ❐No	
Is sampler ON upon departure?	❐Yes ❐No	

Additional Notes:

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted	Tech QC	RNV-RCRA Review

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ATTACHMENT 7 – ISCO AVALANCHE CONFIGURATION SETTINGS

ISCO Avalanche Configuration Settings

Parameter	All programs
Maintenance	
Set Clock	[Set to MST]
Pump Tube Alarm	[1,000,000]
Reset pump counter	No
Run diagnostics	Yes
Re-initialize	No
Software Options	
Liquid detector	Liquid detect on
Target temperature	°C
Measurement interval	1 minute
Dual sampler mode	Off
Bottle full detect	Yes
Event mark	Every sample
Duration	3 second pulse at initial purge
Presample purge counts	100
Post sample counts	Dependent on head
Periodic serial output	No
Interrogator connector power	Alarm dial-outs only
Manual Functions	
Grab Sample	Manual option
Calibrate volume	Manual option
Operate pump	Manual option
Move distributor	Manual option
Other Settings/Misc	
Suction line diameter	3/8 inch
Suction line type	Teflon
Program lock	Disable

ATTACHMENT 8 – ISCO AVALANCHE PROGRAM SEQUENCE

Parameter	Time sampling, single bottle composite sample	Time sampling, 1-part program	Time sampling, 2-part program
Program			
Program mode	Extended	Extended	Extended
Program name	COMPOSITE	1-PART (# bottles)	2-PART (# bottles)
Site description	Station number	Station number	Station number
Units (length)	ft	ft	ft
Units (temperature)	°C	°C	°C
Data storage interval	1 minute	1 minute	1 minute
Number of bottles	1	4 or 14	4 or 14
Bottle volume	10000 ml, 4000 ml	2000 ml, 950 ml	2000 ml, 950 ml
Suction line length	X feet	X feet	X feet
Enter Head Manually	Yes	Yes	Yes
Rinse cycles	1	1	1
Retries	1	1	1
One-Part Program			
Pacing	Uniform time paced	Uniform time paced	N/A
Time between samples	Every one minute	Every one minute	N/A
Composite	1 sample	N/A	N/A
Run continuously	No	N/A	N/A
Take X sample(s)	1	N/A	N/A
Distribution	N/A	Sequential	N/A
Volume	Select between 10 ml and full container volume	Select between 10 ml and full container volume	N/A
Sample volumes dependent on flow	No	No	N/A
Enable programmed	None	None	N/A
Once enabled, stay enabled	Yes	Yes	N/A
Sample at enable	Yes	Yes	N/A
Sample at disable	No	No	N/A
Pauses and resumes	0	0	N/A
Delay to start	No	No	N/A

ATTACHMENT 9 – LANL MSGP ISCO SAMPLER WINTER SHUT-DOWN FORM 045-5

ENV-QP-045.0

LANL Multi-Sector General Permit
ISCO Sampler Winter Shutdown Form

Form 045-5 (3/2011)

Outfall: **3-PSP-5 : E121.9-ISCO 12** Project ID: **P-MSGP-833** Work Order ID: **MSGP-12803**

Target Date: **11/30/2011**

Project: MSGP ISCO Sampler Winter Shutdown

Reason: MSGP Sampler Winter Shutdown 2011

Date:________________ Time:______________

Name/Z#:______________________________

Name/Z#:______________________________

Lead Signature:__________________________

"I confirm the information as recorded is true, accurate and complete."

Verify the equipment list below. Make corrections as required and fill in missing information (e.g., serial numbers).

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640		Actuator Height	
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Bottle Set	12c- 1 1L Poly
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Program	Time / Multiplex no delay
Pb-Acid Battery				Voltage	> 11.7 V

ISCO Sampler Tasks	Note: If "No" provide correct information or explanation.	
Turn ISCO unit "OFF."	❒Yes ❒No	
Place caps securely on bottles in the sample carousel.	❒Yes ❒No	
Verify equipment list above.	❒Yes ❒No	
ISCO 3700 Sampler Units		
Disconnect and remove battery. Transport battery to MSGP stockroom for maintenance and storage.	❒Yes ❒No	
Place battery cables securely inside Greenlee box or ISCO casing.	❒Yes ❒No	
Pull up actuator and tubing and store in Greenlee box or ISCO casing.	❒Yes ❒No	
Avalanche ISCO Sampler Units:		
Disconnect and remove batteries. Transport batteries to MSGP stockroom for maintenance and storage.	❒Yes ❒No	
Place battery cables securely inside Greenlee box or ISCO casing.	❒Yes ❒No	
Pull up actuator and tubing and store inside Greenlee box or ISCO casing.	❒Yes ❒No	
Transport Avalanche sampler to MSGP stockroom for maintenance and storage.	❒Yes ❒No	

Additional Notes:

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted	Tech QC	ENV-RCRA Review
____________	____________	____________

ATTACHMENT 10 – LANL MSGP ISCO SAMPLER DECOMMISSION FORM 045-6

ENV-QP-045.0

LANL Multi-Sector General Permit
ISCO Sampler Decommission Form

Form 045-6 (3/2011)

Outfall: **3-PSP-5 : E121.9-ISCO 12** Project ID: **P-MSGP-834** Work Order ID: **MSGP-12804**

Target Date: 7/27/2011

Project: MSGP Sampler Station Decommission

Reason: MSGP Sampler Decommission

Date:____________ Time:____________

Name/Z#:____________

Name/Z#:____________

Lead Signature:____________

"I confirm the information as recorded is true, accurate and complete."

Verify the equipment list below. Make corrections as required and fill in missing information (e.g., serial numbers).

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640		Actuator Height	
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Bottle Set	12c- 1 1L Poly
ISCO Sampler 12c	Teledyne ISCO	ISCO 3700	198H01553	Program	Time / Multiplex no delay
Pb-Acid Battery				Voltage	> 11.7 V

ISCO Sampler Tasks	Note: If "No" provide correct information or explanation.	
Is equipment list above complete and accurate?	❒Yes ❒No	
Turn sampler "OFF." Remove bottles from carousel.	❒Yes ❒No	
Disconnect and remove battery(ies), solar panel, and cables (as applicable).	❒Yes ❒No	
Pull up actuator and tubing. Disconnect from sampler unit.	❒Yes ❒No	
Uninstall Greenlee box, as applicable.	❒Yes ❒No	
Transport all removed equipment to the MSGP stockroom for maintenance and storage.	❒Yes ❒No	

Additional Notes:

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted ____________	Tech QC ____________	ENV-RCRA Review ____________

ENV-CP-QP-048.1		
Effective Date: September 5, 2013	Next Review Date: August 5, 2015	

Environment, Safety, Health Directorate

Environmental Protection – Compliance Programs Quality Procedure

Processing MSGP Stormwater Samples

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ADESH-OIO, QA Specialist	Signature on file	8/28/13

Derivative Classifier: ☐ **Unclassified** ☒ **DUSA_____ENVPRO_____________**

Name:	Organization:	Signature:	Date:
Ellena Martinez	ADESH-OIO	Signature on file	8/29/13

Approval Signatures:

Subject Matter Expert: Holly Wheeler	Organization: ENV-CP	Signature: Signature on file	Date: 8/29/13
Responsible Line Manager: Michael Saladen	Organization: ENV-CP Team Lead	Signature: Signature on file	Date: 8/29/13
Responsible Line Manager: Anthony Grieggs	Organization: ENV-CP Group Leader	Signature: Signature on file	Date: 9/5/13

CONTROLLED DOCUMENT

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	07/11	New Document.
1	09/13	Annual Review and Revision, new format, process change, and new organization name.

Table of Contents

1.0 PURPOSE

This procedure describes the process for preserving stormwater samples for shipment to an offsite analytical laboratory.

2.0 SCOPE

This procedure applies to all LANL personnel and subcontractors who conduct chemical preservation of stormwater samples either in the stormwater Laboratory located in TA-59-1 or out in the field.

2.1 HAZARD REVIEW

The work specified in this procedure is conducted in accordance with the following integrated work documents: IWDs 007, 007a, 007b, 007c, 007d, 007e, 007f, 008, 010, 010b, and 010c. Each IWD is associated with a specific FOD depending on location of sample activity. The hazard level of this procedure is **MODERATE**.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-CP staff and contract personnel who process Stormwater samples for the MSGP.

The training method for this procedure is "self-study" (reading). For ENV-CP staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

In addition to training to this procedure, the following training and data systems access is also required prior to performing this procedure:

- Personnel performing this procedure will be familiar with the most recent version of the ENV-CP MSGP Sampling and Analysis Plan.
- WES-EDA-QP-219, *Sample Control and Field Documentation*
- ENV-RCRA-QP-022, *MSGP Stormwater Corrective Action*

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are generated as a result of this procedure and are maintained in accordance with ENV-DO-QP-110, *Records Management Program* with the originals on file at ENV-CP records room:

- Copy of the Sample Collection Log/Field Chain of Custody Form

5.0 WORK PROCESSES

The Environmental Protection Agency (EPA) issued the National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) on September 29, 2008. The MSGP requires LANL to monitor stormwater runoff from industrial sites relative to potential pollutants.

Stormwater samples are collected in the field either from refrigerated Avalanche™ or ISCO 3700™ automated samplers. Chemical preservation is conducted in the Stormwater Laboratory (in TA-59-01) immediately following sample collection or in the field.

A LANL Project Leader is the primary person responsible for the steps in this procedure.

The following equipment and tools are required:

- Copy of this procedure
- Copy of Integrated Work Documents (IWDs)
- Copy of the ENV-CP MSGP Sampling and Analysis Plan
- Work Orders (if issued)
- Sample Collection Log/Field Chain of Custody Form (provided by the Sample Management Office (SMO)
- Sample containers
- Sample container labels
- Necessary keys
- Safety glasses with side shields
- Nitrile gloves
- Leather gloves or equivalent work gloves
- Glass and poly bottles appropriate for samples to be collected at the site (reference sampling plan)
- Preservative
- Lids for bottles
- Teflon tubing for intake
- Tygon tubing for exhaust

5.1 PROCESSING SAMPLES

Step	Action
1	Obtain required Sample Collection Log/Field Chain of Custody Form(s) from the SMO. Collect samples and deliver them to the Water Laboratory in coolers containing Blue Ice®.
2	Double check to make sure the Location ID on the Sample Collection Log/Field Chain of Custody Form matches the sample collection station number. If preservation beyond ice is indicated on the form, obtain required preservative and sample containers for identified volume if different from the amount of sample collected. **NOTE:** Specific preservatives and required sample volumes are listed on the Sample Collection Log/Field Chain of Custody Form.
3	Process only one sample set (i.e., samples from one site) at a time. **NOTE:** Sample collection bottles are the bottles used to collect the sample in the field. Sample containers are containers/bottles that the original sample is transferred to after processing. These

	containers are transferred to the Sample Management Office for shipment to the analytical laboratory.
4	Affix appropriate label to sample container.
5	Split up samples into appropriate sample containers.
6	Verify that the sample ID number on the container label matches the sample ID number on the Sample Collection Log/Filed Chain of Custody Form

The following steps should be followed when preserving samples:

Step	Action
1	**IMPORTANT:** Preservation entails the addition of acid or base to a sample. Acids used include hydrochloric acid (HCl), nitric acid (HNO_3), and sulfuric acid (H_2SO_4). Bases used in preservation include sodium hydroxide (NaOH). These are all strong acids and bases that can cause severe burns. Extreme care should be taken when using these acids and bases.
2	Preserve (add acid or base) samples according to the requirements on the Sample Collection Log/Field Chain of Custody Form. **NOTE:** Make sure the pre-measured preservative labeled size matches the sample container size. If you only have one size pre-measured preservative that does not match the sample container size you may need to use more than one. For example, if you have a 1 liter sample container and 500 ml pre-measured preservative vial, you would need to add two preservative vials to the sample container.
3	Mark each container after preservative has been added to designate that the process has taken place.
4	Securely affix lid to sample container. Clean and dry the exterior of sample container, ensure lid is on securely, and check sample container for leakage and breakage.
5	Apply chain-of-custody tape around the mouth and lid of the bottle.
6	Carefully place sample containers in the cooler and package sample containers with Blue Ice®.

5.2 SUBMIT SAMPLES FOR SHIPPING

Submit samples with original Sample Collection Log/Field Chain of Custody Form to SMO for shipping to an offsite analytical laboratory. The person delivering the sample to SMO relinquishes the sample by signing, dating and recording the time under “Relinquished By.” The SMO accepts samples by signing, dating and recording the time under “Received By.” Obtain a signed copy of the Sample Collection Log/Field Chain of Custody Form from the SMO. Make a copy of the Sample Collection Log/Field Chain of Custody Form and provide it to the MSGP Project Leader.

Every attempt will be made to minimize the amount of waste generated. Field personnel will diligently collect only the volumes identified as the minimum or maximum allowable identified on Form. If there is not enough liquid collected to meet these volumes, the Stormwater will be discharged at the sampler location. Extra Stormwater collected will also be discharged at the sampler location. If waste is generated, contact the Waste Management Coordinator for TA-59-1 or the MSGP Project Leader.

5.3 DATA QUALITY OBJECTIVES

The 2008 MSGP permit requires quarterly and annual Stormwater monitoring to determine if pollutants from industrial activities are migrating into U.S. waters. The permit specifies benchmark parameters that are indicators of potential pollutant sources. In addition, certain impaired water quality standards must be met. Factors which must be considered in making the decision of whether pollutant sources are present or water quality standards have been exceeded are analytical data quality and whether the collected sample is representative of the permitted discharge.

To determine whether the Laboratory is in compliance with all relevant laws and regulations, sample collection and analytical data must be evaluated by the a representatives of ADESH, Operations and Integration Office (OIO) by requesting formal focused validation and/or by the MSGP Project Leader.

Sample collection and submission is conducted under the guidelines found in:

- NPDES Permit Tracking No. NMR05GB21
- 40 CFR Subpart 136 Guidelines establishing the test procedure for the analysis of pollutants.

Sample analysis must use EPA approved methods as set forth in the NPDES permit.

Benchmark levels are identified in the 2008 MSGP. Outfall and sampling locations are identified in the individual facility Stormwater Pollution Prevention Plans (SWPPP).

Monitoring frequencies and reporting requirements are specified in the 2008 MSGP.

Sampling location(s):

Annual, quarterly, and visual assessments shall be conducted in compliance with the monitoring requirements specified in the 2008 MSGP. As specified previously, specific sampling location(s) are identified in the facility specific SWPPP.

Grab Sample:

A minimum of one grab sample from a discharge resulting from a measurable storm event is required. Samples must be collected within the first 30 minutes of a measurable storm event. If that is not possible, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the required time frame. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

NOTE: A grab sample is defined as a single sample collected at a NPDES outfall (using approved EPA methods) at a particular time that represents the composition of the stormwater at that time and place.

Representative Sampling:

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

MSGP Discharge Monitoring Reports and Other Reports (MDMRS):

Monitoring results must be reported on an MDMR form (EPA Form No. 2040-0004) in accordance with the "Instructions for Completing the MSGP Industrial Discharge Monitoring Report" provided on the form. The permittee shall submit the original MDMR signed and certified to EPA as required by Part 7.1 of the MSGP.

Duty to Comply:

The permittee must comply with all conditions of the 2008 MSGP permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action.

5.4 Develop a Decision Rule

If analytical results from monitoring activities are above benchmark and/or natural background levels, a corrective action is entered into the ENV-CP Corrective Action Report Database, in accordance with ENV-RCRA-QP-022, *MSGP Stormwater Corrective Actions*. An e-mail is automatically generated and sent to personnel responsible for evaluating and modifying controls to prevent further exceedances. Data validation is conducted under the guidelines of the DOE Statement of Work.

Acceptable analytical error is addressed in the DOE Statement of Work.

The current MSGP monitoring program is based on the 2008 MSGP. Activities that could affect the current or next MSGP permit include:

- Addition or removal of constituents into the 303(b) list,
- Discontinued monitoring based on no detection or constituent levels below benchmark or natural background,
- Specific changes identified by EPA within the next permit,
- DOE Statement of Work requirement for analytical laboratories.

6.0 REFERENCES

None

7.0 DEFINITIONS

None

8.0 ATTACHMENTS

Attachment 1- Example Sample Collection Log/Field Chain of Custody Form

Attachment 2- Sample Container Labels

ATTACHMENT 1- SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY FORM

Los Alamos National Laboratory

Page 1 of 1

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4179 **EVENT NAME:** MSGP - 2013

SAMPLE ID: WTMSGP-13-29841 **WORK ORDER:**

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
DATE COLLECTED (MM/DD/YYYY):		08/18/13	**FIELD MATRIX:**	WT	OK
TIME COLLECTED (HH:MM):		1334	**MEDIA:**		
PRS ID:		OK	**SAMPLE TECH CODE:**	APS	
LOCATION ID:	03-0038W		**FIELD PREP:**	UF	
LOCATION TYPE:			**FIELD QC TYPE:**	REG	
TOP DEPTH:			**SAMPLE USAGE:**	COMP	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
	MSGP-Zn	1 LITER POLY	1	HNO3	y	

SAMPLE COMMENTS:

Q3

LOCATION COMMENTS:

FIELD PARAMETERS:

COLLECTED BY (PRINT) MARWIN SHENDO

RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time
Marwin Shendo MSLP.	8/22/13 11:45	S. Sherwood Sherri Sherwood	8/22/13 11:45

Report Date 08/01/2013

COPY

ATTACHMENT 2- SAMPLE CONTAINER LABELS

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: Ag+As+Cd+Mg+Pb+Se+Hg	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: NAOH	
Analysis: MSGP-CN(TOTAL)	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: H2SO4	
Analysis: MSGP-COD	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: H2SO4	
Analysis: MSGP-NH3-N	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: MSGP-GrossA	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	1 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	2 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	3 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29859	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: Ag+As+Cd+Mg+Pb+Se+Hg	
Date:	**Time:**

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29859	
Container: 0.5 LITER POLY	1 of 1
Preservative: NAOH	
Analysis: MSGP-CN(TOTAL)	
Date:	**Time:**

ENV-RCRA-QP-047.1		
Effective Date: May 14, 2013	Next Review Date: April 14, 2015	

Environment, Safety, Health Directorate

Environmental Protection – Water Quality and RCRA Quality Procedure

Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ENV-QPMO QA Specialist	Signature on file	3/7/13

Derivative Classifier: ☒ **Unclassified** ☐ **DUSA____________**

Name:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA	Signature on file	5/14/13

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Holly Wheeler	ENV-RCRA	Signature on file	3/20/13
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Terrill Lemke	ENV-RCRA Team Lead	Signature on file	5/3/13
Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA Group Leader	Signature on file	5/14/13

CONTROLLED DOCUMENT

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	03/11	New Document.
1	02/13	Annual Review and Revision

Table of Contents

1.0 PURPOSE

This procedure describes the process for inspecting ISCO storm water runoff samplers and retrieving storm water runoff samples from all locations where the Los Alamos National Laboratory (LANL) conducts storm water sampling activities for the Multi-Sector General Permit (MSGP).

2.0 SCOPE

This procedure applies to the ENV-RCRA technical staff and subcontractor personnel conducting activities at single stage stations used for monitoring under the MSGP.

2.1 HAZARD REVIEW

Hazards in the work described in this procedure are controlled thorough site specific IWDs. The hazard level of the activities in this procedure is **moderate**.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-RCRA technical staff and subcontract or other personnel who inspect storm water samplers and retrieve storm water samples for the MSGP.

The training method for this procedure is "self-study" (reading). For ENV-RCRA staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

Personnel performing this procedure will be familiar with the most current versions of the following procedures and operation manuals:

- ENV-RCRA MSGP Sampling and Analysis Plan for the current monitoring year.
- Manual for Teledyne ISCO Sampler model 3700.
- Manual for Teledyne ISCO Avalanche sampler

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are generated as a result of this procedure and are maintained in accordance with ENV-DO-QP-110, *Records Management Program* with the originals on file at ENV-RCRA offices:

- Completed work order for ISCO Sampler Inspection and Sample Retrieval and Collection forms (example in Attachment 2).

5.0 WORK PROCESSES

ISCO samplers are used to collect storm water runoff for Multi-Sector General Permit (MSGP) Program stations. ISCOs are designed to automatically collect water when the water surface is high enough to trigger the actuator and fill the sample bottles. Field personnel are required to inspect the sampling station while retrieving water samples and at other intervals determined by the project or as directed by work orders issued by project personnel.

A LANL Project Leader is the primary person with responsibility for the steps in this procedure. ENV-RCRA personnel will be appointed with responsibility for a subset of sampling stations.

If subsequent rain events occur before all sampler locations have been visited after the first rain event, finish the route to collect the first-event samples (safety permitting).

Inspections may be discontinued during periods or conditions that make sites dangerous for worker safety or prevent personnel from safely accessing sites (e.g., weather-related events such as flash floods, flooding, lightning, wildfires, hail, icy roads, deep snow, and LANL operations such as shots or burns at the OBOD sites).

5.1 EQUIPMENT AND TOOLS

Ensure the following equipment is available in the field vehicle:

- Copy of this procedure
- Copy of the Integrated Work Documents (IWDs)
- Charged spare battery(ies)
- Battery voltage tester
- Spare tubing (pump, suction, discharge types, sampler specific)
- Spare/replacement sample bottles (glass and poly)
- Shovel
- Wooden stakes
- Plastic wire “zip” ties
- Cell phone (only government cell phones with batteries removed are allowed in secure areas)
- Appropriate tools in tool box
- Issued Work Orders and associated forms
- Necessary access and station keys
- Coolers with ice or Blue Ice®
- Expanded Site Field Maps
- Nitrile gloves
- Paper Towels
- Marker pen (permanent, waterproof)
- Ball point pen
- Zip lock bags
- Safety glasses with side shields
- Chain of custody seals
- Sturdy hiking boots or steel toed shoes with soles that grip

5.2 PREPARING FOR FIELDWORK

Once the work orders have been approved, the following steps should be followed to prepare for fieldwork:

Step	Action
1	Receipt of a work order indicates that sampler inspections have been approved by the LANL Project Leader. Schedule work to be completed by the target date appearing on the work order(s).
2	Distribute work order(s) to field personnel. A sample Work Order form is provided in Attachment 1, ISCO Sampler Inspection and Sample Retrieval Form.
3	Inform (e.g., by e-mail) the Field Operations designee, as specified in the IWD, of the schedule for sampler inspection work and locations up to a week (preferred) before but no later than the day before (for minor changes) to be added to the appropriate plan of the day.
4	For work at sites operated by Weapons Facility Operations or Nuclear Environmental Sites, notify the appropriate access control before traveling to those sites. The IWD Part II (2101 Form) addresses specific requirements and training for these sites.
5	Obtain any necessary additional paperwork before conducting this work, including IWD's, and excavation permits (if necessary).
6	Gather the required equipment (see section above) for the work to be done.
7	Set watch(s) to the precise Mountain Standard (not daylight saving) Time. This can be done by logging on to the time page at www.time.gov (or click on the clock icon on the lab's internal home page). When at the site, the clock time on the ISCO sampler needs to be verified. Clocks must be set to Mountain Standard Time at all times, with no daylight saving time adjustment.

5.3 INSPECTING THE SAMPLER

The following table details the inspection requirements for the sampler:

Step	Action
1	If conditions prevent a sampler inspection, document the conditions on the work order and notify the Project Lead or designee within 24 hours. Multiple attempts can be documented on the original inspection work order up to the target date. After the target date, return work order to the ENV-RCRA Storm Water Data Stewards Team for reissuance (if necessary).
2	Item 1: on work order (see example in attachment 2): Enter the date and time inspection and water retrieval is performed and the name(s) and Z number(s) of the field personnel performing the work in the upper right corner of the work order.
3	Item 2: Verify and document the sampler is ON and its condition upon arrival by checking the "Yes" or "No" box. Explain any non-functional status in third column.
4	Item 3: Verify and document the ISCO programming displays by checking the "Yes" or "No" box in second column. • For ISCO 3700 samplers = "Sampler Inhibited"

	OR • For Avalanche samplers = “Program Disabled” If No, repair or describe (e.g., “Done X samples”, or “sampler off”, etc). If more space is needed, continue notes in the “Additional Notes” section at the bottom of the page.
5	Don nitrile gloves and safety glasses.
6	Remove the lid from the sampler.
7	Item 4: If water was collected, check “Yes” and collect the water according to the steps in “Retrieving Storm Water Runoff Samples” below. Note: Complete the required MSGP Visual Assessment form to document the water appearance (foam, sheen, etc.). Ensure this form is submitted to the appropriate MSGP project personnel (see item 11). If No, describe (e.g., “no water collected”, “sampler off”) in the third column; check “No” for Item 4.
8	Item 5: Verify and document the sampler is set to the correct Mountain Standard Time +/- no more than 1 minute by checking the “Yes” or “No” box in the second column. If the sampler is set incorrectly, reprogram for the correct Mountain Standard Time. Describe the work performed and correction applied (e.g., “ISCO clock was X minutes slow”) in the third column.
9	Item 6: Review the Sampling Results report and document any error messages from the sampler display by checking the “Yes” or “No” box. If a message is displayed, record the message in the “Comments” section on page 2 next to the sample bottle being filled when the problem occurred. If there is no indication of flow and the sampler triggered due to a non-flow event (e.g., animal, tumbleweed), indicate this in the third column.
10	Item 7: For the Avalanche sampler equipped with an ISCO 701 pH Module, record the pH measurement taken at the time of Bottle 1 from the Combined Results report.
11	Item 8: For Avalanche samplers only, and if water was collected, check “Yes” and record the refrigerator temperature (°C) upon arrival. If no water was collected, or unable to review temperature, check “No” and describe in column 3 (e.g., no sample, dead battery).
12	Item 9: Verify and document whether sample volumes were retrieved by checking the “Yes” or “No” box. Refer to the volume retrieval instructions on page 2 of work order. Record the volume retrieved in third column.
13	Item 10: If water was collected, perform a visual assessment of the water using the MSGP program visual assessment form (not included in this procedure). Document whether a visual assessment was performed by checking the “Yes” or “No” box.
14	Item 11: Verify and document sample station equipment, model, serial number, actuator height, sampler program, and bottle configuration match the header on the work order page 1 by checking the “Yes” or “No”. If they do not match the data on the work order, ensure you are at the correct location. If the location is verified, check “No” and update inaccurate information.
15	Item 12: Verify and document power supply function. Use the voltage tester to check the voltage of the battery and record the voltage. Check “Yes” or “No” to indicate if battery voltage is acceptable (≥11.7 V for non-floating charged batteries at ISCO 3700 samplers and ≥11.0 for floating-charged batteries at Avalanche samplers as described in ENV-RCRA-QP-045).
16	Item 13: Verify and document the sampler passed the diagnostics test by checking the “Yes” or “No” box. Directions for running the diagnostics test is provided in ENV-RCRA-QP-045)

	If maintenance is necessary and can be performed at the time of inspection, perform the work and describe in third column. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in the third column.
17	Item 14: Verify and document the sample tubing passed a suction test by checking the “Yes” or “No” box. Check the condition of sample tubing and vent tubing. If maintenance (e.g., clearing the tube, replacing the tube) is necessary and can be performed at the time of inspection, perform the work and describe in third column. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in third column.
18	Item 15: Verify all cable and electrical connections are attached and secure by checking the “Yes” or “No” box. If maintenance (e.g., tightening connection, replacing cables) is necessary and can be performed at the time of inspection, describe the work performed in the third column. If more space is needed, continue notes in the “Additional Notes” section. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in the third column.
19	Item 16: Verify and document sampler is ON prior to departing the site by checking the “Yes” or “No” box. If the sampler is not on, document the reason.
20	Item 17: If the sampler tripped and requires reset of the sampling program, reset the actuator by toggling the switch to “Reset” then back to “Latch” • Verify and document the ISCO programming displays the following by checking the “Yes” or “No” box in column 2, page 1. • ISCO 3700 stand-alone samplers = “Sampler Inhibited” OR • Avalanche samplers = “Program Disabled” If an error occurs, reconfigure the sampler (see ENV-RCRA-QP-045 for settings)
21	Item 18: Verify and document any maintenance completed while on site. Describe the work performed or indicate “none completed” in third column. Maintenance items may include (but are not limited to) battery replacement, tubing clearing or replacement, site clearing, securing electrical connections, or sampler diagnostics or repair.
22	Item 19: Verify and document any follow-on maintenance needed that could not be completed while on site. Describe the needed maintenance in the third column. If more space is needed, continue notes in the “Additional Notes” section. A separate work order for the station maintenance will be issued. If no follow-on maintenance is required, indicate “none required” in third column. Maintenance items may include (but are not limited to) battery replacement, tubing clearing or replacement, site clearing, securing electrical connections, or sampler diagnostics or repair.
23	Item 20: If no storm water samples were collected by the sampler, draw a line through page 2 of the work order, initial, and date. If storm water samples were collected by the sampler, skip to “Retrieving storm water runoff

	samples" section.
24	Replace and secure the sampler lid and secure the sampler shelter (if sampler is in a shelter).
25	Review the completed work order(s) for accuracy and completeness and sign and date "Review by Signature" line on page 2 of work order.
26	Item 21: Review the work order(s) for accuracy and certify that the information submitted is "true, accurate, and complete" by signing and dating "Lead Signature" line on page 1.
27	Return completed original work orders to the Project Leader the same day following completion of field work. If original work orders must remain with collected samples, return photocopies of incomplete work orders to the Project Leader the same day field work is completed. Stamp or write "Copy" on the work order returned.

5.4 Retrieving Samples

The following steps should be followed when retrieving samples:

Step	Action
1	Don nitrile gloves and safety glasses.
2	See flow chart in Attachment 1. Item 5: Refer to the "Earliest Sample Collect Date" on work order. If the "Earliest Sample Collect Date" field is empty OR the ISCO sample collection date is ON or AFTER that date, samples may be retrieved per the volume requirements given on the work order. Continue with next step below. If the ISCO sample collection date is BEFORE the "Earliest Sample Collect Date": • Indicate "non-qualifying storm event" in Item 5 third column. • Discard the collected sample water on the ground. • Skip to Step 10 below.
3	Remove filled and partially-filled bottles from the carousel.
4	Add up the total volume of water collected and check that the collected volume of water in glass and poly matches the required volume in the header of the work order page 2. The volume of water required to complete a sample set may vary. Retrieval of partial volume is allowed as long as the minimum specified volume is met. For <u>"Partial Volume Retrieval Allowed, Minimum Volume NOT Met"</u> samplers: If sample volume was sufficient, continue with next step 5 below. If sample volume was NOT sufficient: • Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel in Item 21. • Record total volume retrieved as "0" in Item 22. • Pour out all water on the ground. • Skip to step 11 below. For <u>"Partial Volume Retrieval Allowed, Minimum Volume Met"</u> samplers: • Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel on Item 21 of page 2

	• Record the specific ISCO displayed message for each bottle, if present, in the "Comments" column on Item 21. • Record total volume retrieved in Item 22. • Skip to step 11 below.
5	For samples retrieved, place lids onto the sample bottles with storm water.
6	Write the date and time collected, Station Number, and the corresponding carousel number on each retrieved sample bottle. Obtain the sample collection date and time from the ISCO sampler.
7	Item 21: Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel. Record the specific ISCO displayed message for each bottle, if present, in the "Comments" column.
8	Item 22: For "Partial Volume Retrieval Allowed, Minimum Volume NOT Met" samplers, if sample volume was NOT sufficient, record the total volume retrieved as "0" and discard sample water on ground. For "Partial Volume Retrieval Allowed" samplers, record the total volume retrieved.
9	Place retrieved sample bottles in a cooler with blue ice (or equivalent).
10	Return any excess water or collected volume that exceeded the amount required to the ground.
11	Install new sample bottles in the carousel for the next sampling event. The number and type of bottles may vary. Ensure bottles match the configuration specified on page 1 of the work order.
12	Item 23: Document any additional notes or site information in the "Additional Notes" section.
13	Return to steps in "Inspecting the Sampler" above.

5.5 DELIVERING SAMPLES

The following steps should be followed when delivering samples:

Step	Action
1	If samples were collected, deliver the samples, and completed, reviewed, and signed work order to the Storm Water Program Laboratory.
2	Item 25: Relinquish samples to MSGP personnel by signing "Relinquished By" or if self processed, refer to ENV-RCRA-QP-048, Processing MSGP Storm Water Samples.
3	Place samples in the refrigerators in the laboratory within the basement of TA-59-1 and lock the refrigerator to prevent tampering.

6.0 REFERENCES

None

7.0 DEFINITIONS

None

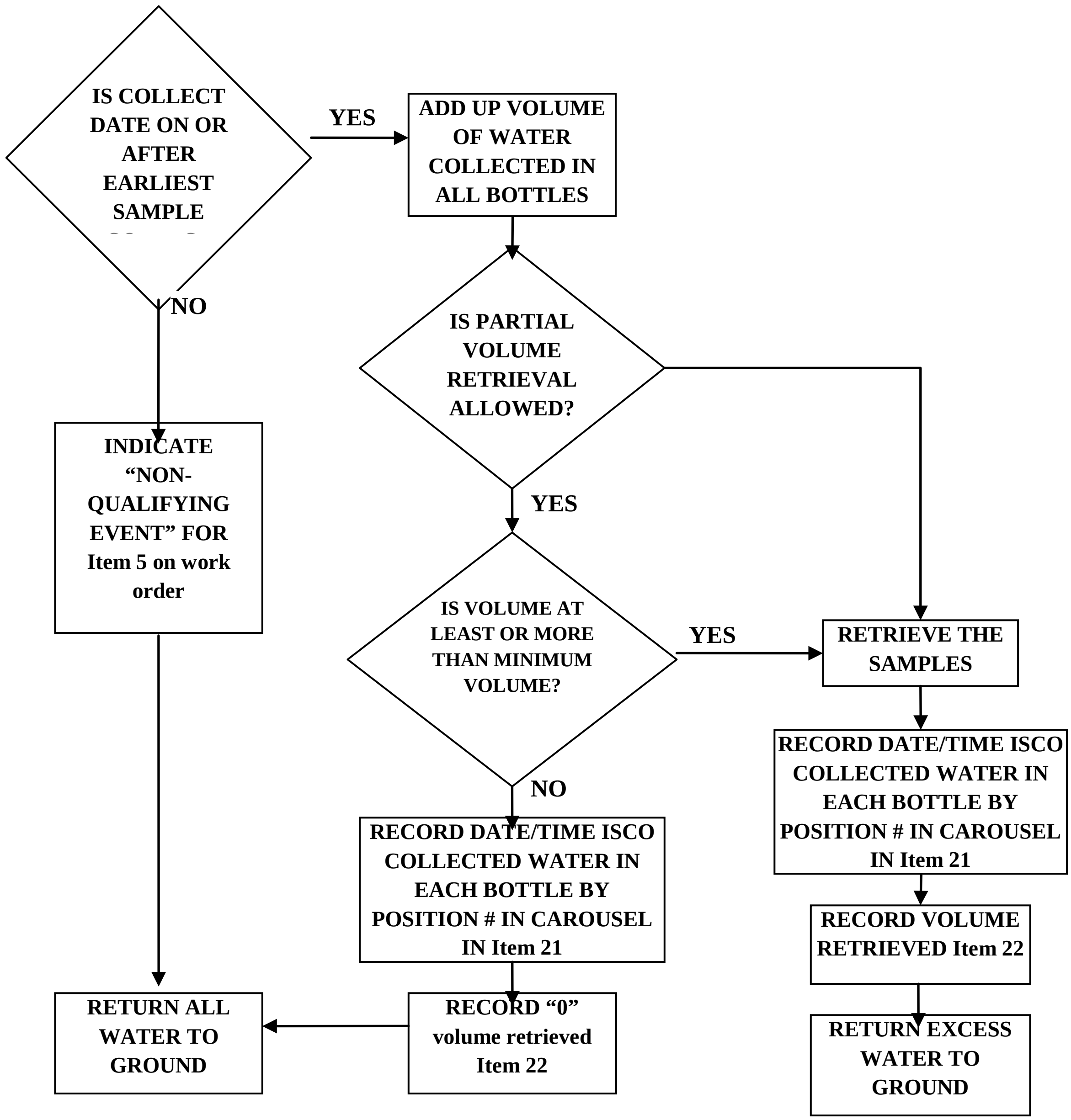
8.0 ATTACHMENTS

Attachment 1- Flow Chart for Sample Retrieval

Attachment 2- ISCO Sampler Inspection and Sample Retrieval Form

By requesting credit for this required reading I acknowledge that I have read and understand the contents of this document and I will follow and meet the requirements in this document unless it is unsafe to do so.	Click to Acknowledge

ATTACHMENT 1- FLOW CHART FOR SAMPLE RETRIEVAL



ATTACHMENT 2- ISCO SAMPLER INSPECTION AND SAMPLE RETRIEVAL FORM

ENV-QP-047.0 | Form 047-1 (3/2011)

LANL Multi-Sector General Permit
ISCO Sampler Inspection and Sample Retrieval Form

Outfall: **3-MFS-1 : 03-0038W** Project ID: **P-MSGP-2046** Work Order ID: **MSGP-26090**

Target Date: **9/30/2012**

Project: MSGP Q3 Sampler Inspection & Retrieval

Reason: MSGP ISCO Sampler Inspection - Sample Retrieval

Earliest Sample Collect Date: 8/1/2012

Date:________________ Time:________________

Name/Z#:________________

Name/Z#:________________

Lead Signature:________________

"I confirm the information as recorded is true, accurate and complete."

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640	210J01655	Actuator Height	2"
ISCO 3700 Sampler	Teledyne	3700	209H01284	Bottle Set	12c- 1 1L Glass, 11 1L Poly
ISCO 3700 Sampler	Teledyne	3700	209H01284	Program	Storm / Multiplex 10 min delay
Pb-Acid Battery	MK Powered	110 A-h	MSGP-110-0310-06	Voltage	> 11.7 V

ISCO Sampler Inspection Tasks	Note: If "No", provide explanation and/or correct information.	
ON ARRIVAL		
Is sampler ON and functioning properly upon arrival?	❒Yes ❒No	
Does ISCO display either "Sampler Inhibited" or "Program Disabled" ?	❒Yes ❒No	
Is ISCO time delta < 1 min (MST)? If NO, record adjustment.	❒Yes ❒No	
Is any water collected? If YES, complete Page 2.	❒Yes ❒No	
Does the Sampling Results report indicate any error messages(s)? If YES, record error message(s) in the applicable Bottle Comment field on Page 2.	❒Yes ❒No	
Is any water collected on or after the "Earliest Sample Collect Date"?	❒Yes ❒No	
Was sample volume retrieved?	❒Yes ❒No	
Was a Visual Assessment performed? If YES, complete the MSGP Visual Assessment form (ENV-RCRA-QP-064.0 Att. 1).	❒Yes ❒No	
ON DEPARTURE		
Is the equipment information listed above, including specifications, correct?	❒Yes ❒No	
Are electrical connections secure?	❒Yes ❒No	
Record battery voltage(s). Voltage(s) > 11.7 V ?	❒Yes ❒No	
Does the ISCO diagnostics test pass?	❒Yes ❒No	
Does sample tubing pass suction test?	❒Yes ❒No	
Is sampler ON upon departure?	❒Yes ❒No	
Has the actuator swtich been reset to "Latch"?	❒Yes ❒No	
Does ISCO display either "Sampler Inhibited" or "Program Disabled"?	❒Yes ❒No	
If any maintenance completed during inspection, check YES and describe.	❒Yes ❒No	
If any follow-on maintenance is required, check YES and describe.	❒Yes ❒No	

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ENV-QP-047.0

LANL Multi-Sector General Permit
ISCO Sampler Inspection and Sample Retrieval Form

Form 047-1 (3/2011)

Outfall: **3-MFS-1 : 03-0038W** Project ID: **P-MSGP-2046** Work Order ID: **MSGP-26090**

Complete if sample bottles contain water OR to to record ISCO message

Sample Volume Requirements		
Bottle Type: Poly or Glass bottles	**Minimum Volume (L):** 0.5	**Maximum Volume (L):** 1

Bottle #	Bottle Type	Date:	Time (MST):	Comments
1	❐P ❐G	/ /2012		
2	❐P ❐G	/ /2012		
3	❐P ❐G	/ /2012		
4	❐P ❐G	/ /2012		
5	❐P ❐G	/ /2012		
6	❐P ❐G	/ /2012		
7	❐P ❐G	/ /2012		
8	❐P ❐G	/ /2012		
9	❐P ❐G	/ /2012		
10	❐P ❐G	/ /2012		
11	❐P ❐G	/ /2012		
12	❐P ❐G	/ /2012		
13	❐P ❐G	/ /2012		
14	❐P ❐G	/ /2012		

Total Volume Retrieved (liters): **Poly** **Glass**

Relinquished by Signature	Date:	Time:	Received by Signature	Date:	Time:

Additional Notes:

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted	Tech QC	ENV-RCRA Review

No: P101-14
Revision: 7

Issued: 08/06/15
Effective Date: 08/06/15

Chemical Management

1.0 PURPOSE

The purpose of this document is to:

- define the chemical management requirements for the Los Alamos National Laboratory (LANL or the Laboratory) Chemical Lifecycle Management Program,
- define processes to ensure protection of workers from health hazards associated with hazardous chemicals, and to keep exposures below Occupational Exposure Limits (OELs),
- provide direction to ensure that work with hazardous chemicals is conducted in a safe and responsible manner that protects workers, the public, and the environment, in accordance with Laboratory Integrated Work Management (IWM) and Environmental Management Systems,
- provide direction in the development and application of the hierarchy of controls (i.e., elimination, substitution, engineering, administrative, and Personal Protective Equipment [PPE]) that will protect workers and the environment, and
- promote consistency in hazardous-materials-related Integrated Work Documents (IWDs) and other procedures across the Laboratory.

2.0 AUTHORITY AND APPLICABILITY

2.1 Authority

This document is issued under the authority of the Laboratory Director to direct the management and operation of the Laboratory, as delegated to the Associate Director for Nuclear and High Hazard Operations (ADNHHO) as provided in the Prime Contract. This document derives from the Laboratory Governing Policies, particularly the section on Safety.

- Issuing Authority (IA): Associate Director for Nuclear and High Hazard Operations (ADNHHO)
- Responsible Manager (RM): Operations Support (OS) Division Leader
- Responsible Office (RO): Operations Support-Division Office (OS-DO)

2.2 Applicability

This document applies to all Laboratory workers. Subcontract workers are expected to follow the requirements set forth in their contractual agreements (i.e., Exhibit F) with the Laboratory.

This document applies to all work areas where chemicals including gases (compressed and cryogenic fluids) are procured, acquired, manufactured, machined, handled, received, distributed, transported, used, stored, or disposed. Activities that are subject to the requirements contained in this document are maintenance, construction, facility categorization, Research and Development (R&D), emergency planning, environmental restoration, and Decontamination and Decommissioning (D&D). This document applies to Laboratory facilities and equipment that involve current or past use of hazardous chemicals. Offsite work by LANL workers, where chemicals are used, should follow the specific guidelines and protocols of the host facility within the context of the guidelines provided herein. Minimum requirements are adherence to the Federal Regulations cited in this document.

3.0 PROCEDURE DESCRIPTION

This document sets forth practices for managing industrial hygiene, safety, and environmental concerns associated with hazardous chemicals.

Note: Every Laboratory organization that procures, acquires, manufactures, machines, handles, receives, distributes, transports, uses, stores, or disposes of hazardous chemicals is required to follow the safety plan found in Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan*. Requirements identified in Attachment A are specific to 29 Code of Federal Regulations (CFR) 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication* (e), 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories* (e), and 29 CFR 1926.59, *Labor, Safety and Health Regulations for Construction, Hazard Communication* (e) (identical to .1200). The processes found in Attachment A, and any associated IWDs and organization-specific procedures that address hazardous chemicals, must be communicated to the workers in the organization. The plan is applicable to all activities whether chemicals are used in industrial applications (Hazard Communication [HAZCOM]) or small-scale laboratory R&D (Chemical Hygiene Plan [CHP]). Where it is mutually beneficial, the plan is applicable to all activities. Where procedures are specific to HAZCOM or CHP, the delineation is made in the text of the plan.

Note: Engineered nanomaterials are addressed in P101-29, *Working with Nanotechnology Materials and Processes*. Biological materials are addressed in P101-15, *Biological Safety.* Explosives are addressed in P101-8, *Explosives Safety*. Radiological materials are addressed in P121, *Radiation Protection*. Chemical disposition is addressed in P409, *LANL Waste Management.*

3.1 Chemical Management and Chemical Safety Program Elements

Table 1. Chemical Management Program Elements

Chemical Management Program Element	Main Document Section	Attachment A Section
A list of the hazardous chemicals known to be present, i.e., an inventory	3.3	1.3
Hazard identification and analysis	Attachment A	All
Acquisition	3.2	NA
Chemical inventory management and tracking, including management of extremely hazardous chemicals, and Material Safety Data Sheets/Safety Data Sheets (MSDS/SDSs)	3.3	1.4 (MSDS/SDS only)
Chemical transportation	3.8	NA
Chemical storage	3.7	NA
Hazard control	3.6	1.6
Pollution prevention and waste minimization	3.4	NA
Chemical emergency management	3.9	NA
Chemical disposition	3.7	NA
Training	6.0	1.15

The LANL chemical management program addresses elements from both 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication,* and 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories.*

Table 2. Chemical Safety Program Elements

Chemical Safety Program Element	Main Document Section	Attachment A Section
A list of the hazardous chemicals known to be present, i.e., an inventory	3.3	1.3
Access to MSDS/SDSs for procured or acquired hazardous chemicals	3.3	1.4
Container labeling and other forms of warning	NA	1.5
Employee information and training	6.0	1.15
Methods used to inform employees of hazards of non-routine tasks or chemicals in unlabeled piping, precautionary measures for protection of employees during normal operating conditions and foreseeable emergencies, and the circumstances under which a particular laboratory operation, procedure or activity will require prior approval from the employer or the employer's designee before implementation	NA	1.6
Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals	NA	1.6
Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of Personal Protective Equipment (PPE) and hygiene practices; particular attention will be given to the selection of control measures for chemicals that are known to be extremely hazardous	3.7	1.6
A requirement that fume hoods and other protective equipment are functioning properly and specific measures will be taken to ensure proper and adequate performance of such equipment	NA	1.8
Designation of personnel responsible for implementation of the Chemical Hygiene Plan (CHP) including the assignment of a Chemical Hygiene Officer (CHO), and, if appropriate, establishment of a Chemical Hygiene Committee	4.2	1.9
Provisions for additional employee protection for work with particularly hazardous substances, i.e., carcinogens, reproductive toxins, and substances that have a high degree of acute toxicity, including as appropriate: establishment of a designated area, use of containment devices such as fume hoods or glove boxes, procedures for safe removal of contaminated waste; and decontamination procedures	4.2	1.11
Compliance with 29 Code of Federal Regulations (CFR) 1910.119, *Labor, Occupational Safety and Health Standards, Process Safety Management of Highly Hazardous Chemicals (Occupational Safety and Health Administration [OSHA] PSM Rule),* Appendix A	4.7	NA
Hazardous chemical spill response	3.9	NA

3.2 Chemical Acquisition

Acquisition includes procurement, onsite synthesis, blending of chemicals, individuals or organizations bringing chemicals onsite, and other mechanisms. Chemicals are purchased by trained and authorized chemical workers.

Before a decision is made to purchase a chemical through LANL procurement, chemical owners will determine whether:

- The proposed quantity of the chemical is within the evaluated safety basis limits, fire protection limits, and fire hazard analysts limits for the facility. ***Note:*** The FOD is responsible for providing this information.
- There is a less hazardous or non-hazardous chemical available.
- There is a suitable surplus chemical available from another chemical owner.
- There is a current need for the chemical.
- There are unique hazards of the chemical that would require special assessment and controls.
- The quantity is limited to a specific project or maintenance need.
- There are stability or shelf life issues that need to be tracked.
- Storage facilities are suitable.
- There is an appropriate safe and environmentally acceptable means for the final disposition of environmentally sensitive chemicals, products, and byproducts.
- The required safety documentation MSDS/SDS is uploaded to the LANL MSDS/SDS electronic binder. Contact Occupational Safety and Health-Industrial Safety and Hygiene (OSH-ISH) for a listing of MSDS Online administrators who can add SDS/MSDSs to the LANL Electronic Binder.

All gas will be procured from the Gas Facility for those maintained as stock items, or as a LANL iProcurement Non Catalog request choosing Compressed Gas as the category. Gases cannot be purchased on a Pcard. All chemical/gases transported as a Hazard Class 2 material must be delivered to the Gas Facility at TA-3, Building 170. The SM-30 warehouse is not allowed to accept the delivery of gas.

Note: Non-gas chemical requests for purchase by purchase card must be submitted for approval via email to ChemDB@lanl.gov. Include the TA, building, and room where the chemical will be stored, the Z# and name of the chemical requestor, the chemical or product name, total amounts requested, the manufacturer and catalog number, and an SDS/MSDS for the chemical or product.

3.3 Chemical Inventory Management and Tracking

- LANL is required to maintain a list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate MSDS/SDS. The listing of hazardous chemicals is maintained in the LANL institutional chemical inventory database application. This inventory is overseen by ADNHHO Operations Support (OS) Division. For LANL institutional chemical inventory database requirements, contact the help desk at 667-9242, or e-mail ChemDB@lanl.gov.
- Primary hazardous chemical containers are barcoded, entered, and tracked in the LANL institutional chemical inventory database in accordance with guidance documents found under the “Support and Resources” tab in the LANL institutional chemical inventory database application.

- The LANL institutional chemical inventory database will be updated when a primary hazardous chemical container is acquired; is transferred to a new owner and/or a new location; or is disposed.
- Physical inventories of primary hazards chemical containers will be performed annually to verify the accuracy of the LANL institutional chemical inventory database. Workers must have access to the MSDS/SDS for all procured hazardous chemicals. See 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication* (g) (6) (iii) and (8) and 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories* (f) (3) (v). MSDS/SDSs must be maintained as stated in Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan,* Section 1.4.

3.4 Chemical Elimination, Substitution, Pollution Prevention, and Waste Minimization

Elimination of a hazardous chemical or substitution of a hazardous chemical with a less hazardous chemical is the preferred method to control hazards in accordance with the IWM process. Process change to a system for pollution prevention or waste minimization is another recognized control for chemical usage. Whenever possible, chemical workers will consider eliminating hazardous chemical usage or substituting less hazardous chemicals for highly hazardous chemicals, according to 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories*, and 10 CFR 1021, *Energy, National Environmental Policy Act Implementing Procedures*. In addition, upstream chemical minimization processes and waste reduction techniques to minimize the quantity of chemical used in an activity will be considered.

Note: The Environmental Protection-Environmental Stewardship Services Group (ENV-ES) may be contacted for assistance in chemical substitution, pollution prevention, and waste minimization. See the Laboratory Chemical Safety Webpage for assistance with surplus chemicals. Transportation of surplus chemicals must comply with requirements in Section 3.8.

Avoid introducing excess chemicals into radiologically controlled areas, to minimize the potential to create a mixed waste. The need for legacy chemicals should be evaluated on at least an annual basis.

3.5 Management of Extremely Hazardous Substances

An extremely hazardous substance present at the Laboratory in an amount greater than or equal to its threshold planning quantity triggers emergency planning requirements as required by 40 CFR 355, *Protection of Environment, Emergency Planning and Notification*. Contact Security and Emergency Operations-Emergency Management Group (SEO-EM) at 667-6211 for assistance in emergency planning and release reporting requirements.

3.6 Hazard Control

Identification, evaluation, and control of hazards associated with chemical use are managed through IWM (see P300, *Integrated Work Management*), and worker exposure assessments (see P101-32, *Worker Exposure Assessments*).

3.7 Hazardous Chemical Storage

Storage includes all physical phases and all types of containers including, but not limited to, tanks, piping, cylinders, and containers of solid, liquid, or gaseous chemicals. Storage includes all chemicals or chemical products, including used and unused chemicals, sealed, opened, or partially filled containers, working solutions, day-use containers, and chemical “residues” left within tanks, piping, or other containers. Storage in this document excludes storage of solid waste or hazardous waste.

Chemical storage will be limited to the quantity necessary to perform the work, and within safety basis and fire protection limits. Liquid hazardous chemicals should be stored so that a spill will not exceed 20 L (5 gallons), as required by the National Fire Protection Association (NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals* and NFPA 400, *Hazardous Materials Code*. Flammable and combustible liquids will be limited to less than the maximum quantities allowed in Tables 10.1.1(a), 10.1.1(b) and 10.1.2 of NFPA 45. Both documents are available to Laboratory workers through the Research Library.

Storage of gas must follow the requirements of NFPA 55, *Compressed Gases and Cryogenic Fluids Code*, and the Compressed Gas Association and be grouped together by type (e.g., flammable, oxidizer, corrosive, toxic and highly toxic gases); segregated from potential hazards; and separated by 20 feet, or a half hour fire barrier in accordance with P101-34, *Pressure Safety*.

Containers of materials that might become hazardous (i.e., peroxidizable chemicals) during prolonged storage will be dated when first opened. At the end of six months after opening, the material will be evaluated or tested for continued safe use. Material that is found to be safe or that can be stabilized to be made safe will be permitted to be re-dated and retained for an additional 6-month period, or according to manufacturer's instructions, whichever is more stringent. All other material will be safely and compliantly discarded.

To protect the environment and the safety and health of all people, hazardous waste will be disposed of properly. See P409, *LANL Waste Management,* for requirements.

Note: See Tool #4, *Chemical Storage Schemes*, and Tool #8, *Minimum Requirements for Peroxidizables*, on the Chemical Safety Tools webpage for additional information about storage requirements for materials that might become hazardous.

Note: The NFPA standards 30, 45, and 55, and the International Building Code define Maximum Allowable Quantities (MAQs) of different categories of chemicals that may be within open and closed systems in facilities. These criteria apply to LANL facilities (via the Prime Contract). The Fire Protection-Division Office (FP-DO) can assist in defining MAQs for specific facilities where those limits are not clearly defined.

3.8 Hazardous Chemical Transportation

Transportation refers to vehicular movement of chemicals, including movement subject to Department of Transportation (DOT) regulations for public roads, site transportation on nonpublic roads, and movement of chemicals within and between buildings. Off-site and on-site hazardous chemical transportation will be done in accordance with P151-1, *LANL Packaging and Transportation Program Procedure*.

Transportation of gases (DOT Hazardous Class 2 Material) must be performed by the Gas Facility in accordance with 49 CFR 100–185, *Transportation, Pipeline and Hazardous Materials Safety Administration, Department of Transportation*.

3.8.1 Off-Site Shipping

Any chemical that meets the definition of a hazardous material, or is suspected to be hazardous material according to 49 CFR 171.8, *Transportation, General Information, Regulations, and Definitions, Definitions and Abbreviations*, and can be classified as a hazardous material in accordance with 49 CFR 173, *Transportation, Shippers—General Requirements for Shipments and Packagings, Parts 115–141 and Parts 403–436*, will be packaged, marked, labeled, and shipped with prepared shipping papers in accordance with 49 CFR 100–185, *Transportation, Pipeline and Hazardous Materials Safety Administration, Department of Transportation*, and applicable Department of Energy (DOE) Orders by DOT trained personnel. Contact Operations Support-Packaging and Transportation (OS-PT) for assistance.

Any chemical being shipped by air that meets the definition of dangerous goods according to the International Civil Aviation Organization will be packaged, marked, labeled, and shipped, with an accompanying properly prepared dangerous goods declaration, in accordance with the International Civil Aviation Organization technical instructions. Contact OS-PT for assistance.

Wastes containing chemicals that are also New Mexico special wastes or hazardous wastes have additional shipping, placarding, manifesting, and training requirements. Contact your Waste Management Coordinator (WMC).

3.8.2 On-Site Transfers of Chemicals

The on-site transfer of hazardous chemicals will follow P151-1, *LANL Packaging and Transportation Program Procedure*. OS-PT has jurisdiction over the requirements for packaging, marking, and documenting on-site transfers.

On-site shipping of analytical-scale samples of hazardous chemicals (DOT small quantities) is permissible, as long as it meets Laboratory and DOT requirements for such samples. An example procedure that meets the Laboratory and DOT requirements for such on-site shipping, including training requirements, is SOP-C-DO-003, *On-Site Shipping of Analytical-Scale Samples of Hazardous or Radioactive Materials (DOT Small Quantities).*

All hazardous chemical transport will be done in a government vehicle. Hand carrying of hazardous chemical containers will be done using secondary containment and laboratory carts for heavy or multiple containers. Exception: Gas must be transferred by Gas Facility personnel in accordance with 49 CFR 100–185, *Transportation, Pipeline and Hazardous Materials Safety Administration, Department of Transportation*.

3.8.3 Hazardous Chemical Spills

Workers must be authorized, provided the necessary training, understand required spill response procedures before working with a hazardous chemical, and ensure that containment and cleanup of a spill is permitted by the IWD.

- Contact SEO-EM Group at 667-6211 then the FOD or the FOD's on-call designee for the building (or the Operations Center if a facility is so equipped), in the event of a large hazardous chemical spill (i.e., a spill that cannot be safely contained by an authorized chemical worker). The FOD or on-call designee must ensure involvement of deployed support as necessary. SEO-EM provides the Incident Commander to manage cleanup of all spills outside the scope of IWDs.
- When safe to do so, authorized chemical workers will determine the extent of the area affected, and demarcate it with barricade tape or use another reliable means to restrict entry into the area.
- Properly briefed, authorized chemical workers may cleanup smaller spills, following spill control, mitigation, cleanup, and reporting procedures listed in the IWD associated with the activity in progress at the time of the spill.

- Workers and their supervisors are required to go to Occupational Medicine for a work-related injury or illness, including exposure to hazardous chemical spills, unless transported directly to Los Alamos Medical Center (LAMC). Prior to return to work, workers must go to Occupational Medicine for follow up.
- Manage all debris and waste resulting from the cleanup of a spill as though it contains the hazardous chemical, according to WMC instruction.

Note: Incidental spill guidance is available on the Chemical Safety webpage under Resources, Systems & Tools.

3.9 Chemical Safety Tools

Chemical safety tools, found on the Chemical Safety webpage, contain safety and health considerations to be followed when using hazardous chemicals. These tools will be supplemented and updated as needed.

4.0 RESPONSIBILITIES

4.1 Associate Director for Nuclear and High Hazard Operations-Operations Support (OS) Division

- Overall accountability for the proper management of the Chemical Management Program.
- Chemical Management Program Manager provides overall coordination of LANL's Chemical Management Program.
- Oversees the LANL institutional chemical inventory database application.

4.2 Associate Director for Environment, Safety, Health (ADESH)

- Maintains a site-wide MSDS/SDS program (OSH-ISH).
- Maintains a site-wide hazard assessment and exposure monitoring database and Comprehensive Tracking System (CTS) (OSH-ISH).
- Consults with the Laboratory community on the development and implementation of chemical hygiene and safety policies and practices (OSH-ISH).
- Annually reviews and updates as necessary per the Hazard Communication and Chemical Hygiene Plan (OSH-ISH).
- Provides medical consultation and examinations for individuals who are exposed or potentially exposed to hazardous materials, including OSHA regulated carcinogens (OSH-OM).
- Provides consultation with respect to reproductive toxicants (OSH-OM, Deployed Services Environment, Safety, and Health [DSESH]).
- Provides assistance in researching less hazardous chemical substitutes (ENV-ES).
- Provides the LANL CHO (OSH-ISH)/Chemical Safety SME.

4.3 Security and Emergency Response Division

- Provides specialized expertise and equipment in response to hazardous materials emergencies at LANL and within the surrounding communities.

4.4 Division Leaders

- Ensure that Division activities involving chemicals are conducted within the safety envelope and the scope of work identified in Division and Facility documents.
- Ensure that adequate resources are provided to Responsible Line Managers (RLMs) to identify, evaluate, and control chemical hazards associated with existing and proposed work performed within their Divisions so that chemical management can be integrated into day-to-day operations.
- Ensure that a chemical safety plan is written for their Division, or provide written documentation that references Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan,* as their Hazard Communication and Chemical Hygiene Plan. Ensure that the written program governs all hazardous chemical work in the group or facility (HAZCOM or CHP), and is referenced in IWDs and other relevant documents.
- Ensure that violations of codes and safety standards identified by reviews or inspections are corrected or that compensatory measures or action plans are developed.
- In CHP areas only, assign a Division Chemical Hygiene Officer (CHO) Group CHOs may be assigned as necessary. Ensure that CHOs have the experience and training as noted in Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan,* Section 1.9.

4.5 Program Directors, Program Managers, and Project Leaders

- Negotiate with RLMs to provide adequate resources for the requirements in this document.

4.6 Responsible Line Managers (RLMs) in Coordination with the Person in Charge (PIC)

- Ensure that primary hazardous chemical containers in their organization are barcoded, and entered and tracked in the LANL institutional chemical inventory database.
- Ensure that workers keep the LANL institutional chemical inventory database current and accurate for their chemicals.
- Ensure that a physical chemical inventory of primary hazardous chemical containers is performed in their organization annually and reconciled in the LANL institutional chemical inventory database.
- Ensure that for any new activity (i.e., an activity that requires a new IWD) a hazard review is completed for hazards that can be encountered or generated during the course of the work. The evaluation must include the hazards associated with the properties and the reactivity of the materials used, any intermediate and end products that can be formed, hazards associated with the operation of the equipment at the operating conditions, and hazards associated with the proposed reactions.
- Ensure that all required training is completed by workers before the work is authorized.
- Integrate chemical life cycle management (purchase through disposition) into resource planning, funding, prioritizing, planning, scheduling, and implementation of work conducted under their supervision.
- Specify the written program governing all chemical work in the group (HAZCOM or CHP) and reference in IWDs and other safety documents.
- Ensure that IWDs are completed and approved for work with Occupational Safety and Health Administration (OSHA) carcinogens and LANL Category 1 (LANL Cat 1) chemicals in CHP areas. See the Chemical Safety webpage.
- Provide job-specific briefings and/or information on the chemical hazards and safety precautions related to each authorized chemical worker's assigned work, before beginning

work. ***Note:*** Never assume that a worker has knowledge of the chemical, its hazards, and the controls. Job-specific information must include:

- chemical inventory, relevant to the employee's assigned work, specific chemicals used, and the location of activities where hazardous chemicals are present;
- specific methods and observations, if applicable, that are used to detect the presence or release of a hazardous chemical;
- the location of the associated MSDS/SDS(s), and how to obtain an MSDS/SDS. For hazardous chemicals used, the following information from each MSDS/SDS must be discussed within a job-specific briefing, or as part of a pre-job briefing:
  - hazards identification;
  - fire protection/incompatibilities;
  - accidental release measures, handling and storage;
  - exposure controls/personal protection;
  - physical and chemical properties; and
  - chemical stability and reactivity information, particularly instability conditions and incompatible chemicals.
- the applicable details of the written Hazard Communication and Chemical Hygiene Plan (see Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan*) and any facility-specific HAZCOM Plan or written CHP;
- secondary container labeling requirements (see Attachment A, Section 1.5.);
- specific building signs and postings for hazardous chemicals;
- Building Emergency Plans;
- locations of eyewashes and safety showers;
- spill response requirements, including mitigation, cleanup, and reporting requirements, and
- specific chemical storage requirements.

- Monitor through Management Observation and Verification (MOV) or other means that equipment and chemical containers are labeled with the name of the contents and that work areas are posted with signs or placards that depict the chemical hazards in the area.
- Monitor through MOV or other means that MSDS/SDSs are accessible to all workers who may have potential exposure to chemicals.
- When authorizing IWDs, ensure that elimination of hazardous chemicals, or substitution of a less hazardous material when practical, has been addressed by the preparer.
- When authorizing IWDs, ensure identification of operations where the following are used: LANL Cat 1 chemicals (CHP), known and suspect human carcinogens, reproductive toxicants, and highly acute toxicity/highly chronic toxicity chemicals (HAZCOM). Ensure that deployed personnel are notified to conduct worker exposure assessments, and that proper controls are established. See the Chemical Safety Webpage.
- Ensure that workers adhere to the requirements in this document.
- Authorize workers to perform chemical work and purchase chemicals.
- Investigate accidents and near misses involving chemicals, and ensure that corrective actions identified from chemical accident investigations and inspections are implemented.

- Ensure that all chemical hazards are removed when vacating space. When an area is being vacated, all chemicals will be moved, transferred to new ownership, or properly disposed. The work area will be cleaned and restored to its original condition or a condition acceptable to the next occupant before transfer of ownership.
- Ensure that resource planning, funding, prioritizing, scheduling, and implementation of chemical work conducted under their supervision addresses the necessary environmental, safety, and health evaluation and controls.
- Inform visitors about the Laboratory's chemical safety policies and procedures and ensure that they are aware of the existence and availability of chemical hazard information and resources.
- Notify DSESH deployed staff of new or modified work activities that require exposure assessments.
- Negotiate with Program Directors, Program Managers, and Project Leaders to provide adequate resources to meet the requirements in this document.
- Ensure that hazards of chemicals and chemical reactions are evaluated before laboratory activities or chemical reactions are begun. See Attachment A, Section 1.11.3.

4.7 Facility Operations Directors (FODs)

- Ensure that new work involving hazardous chemicals is reviewed by appropriate Subject Matter Experts (SMEs).
- Communicate Safety Basis levels to RLMs and maximum chemical quantities allowed to tenants.
- Maintain a proactive preventive maintenance program to ensure that laboratory engineering controls and emergency equipment (e.g., ventilation systems, detectors, shutoff devices, and emergency eyewash and safety showers) are in proper operating condition.
- Inform on-site construction/equipment subcontractors of the presence and identity of hazardous chemicals in their immediate work areas.
- Notify building occupants of testing, demolition, construction, and renovation activities and their related chemical hazards before initiation.
- Work with the Subcontract Technical Representative (STR) to ensure that subcontractors comply with Exhibit F and other subcontractor requirements.
- Working with Acquisition Services Management-Project Management and the STR, ensure that subcontractors provide an inventory and the MSDS/SDS for hazardous chemicals brought on-site to the Environment, Safety, Health (ESH) manager or designee, SEO Division personnel.
- Ensure that chemical incidents are reported and investigated and that corrective action is taken to prevent recurrence.
- Provide facility-specific information so tenants are aware of bounding chemical thresholds.
- Ensure that facilities maintain quantities (by weight) of highly hazardous chemicals below threshold quantities (see Process Safety Management (PSM) List [use Firefox]).

4.8 Deployed Services Environment, Safety, and Health (DSESH) Deployed Personnel

- Assist line managers in performing and documenting hazard assessments and risks for existing and planned operations, including laboratory moves and decommissioning.
- Provide guidance for establishing administrative, work practice, PPE, and engineering controls. Assist in determining labeling requirements for equipment, piping, containers, and facilities.
- Perform and document worker exposure assessments and exposure monitoring to determine employee exposures to hazardous materials and to evaluate the adequacy of controls in accordance with P101-32, *Worker Exposure Assessments.*

4.9 Authorized Chemical Owners

- Ensure that all their primary hazardous chemical containers are barcoded and entered into the LANL institutional chemical inventory database.
- Ensure that the LANL institutional chemical inventory database is updated when one of their primary hazardous chemical containers is transferred to a new owner and/or a new location; or is disposed.
- Complete the training requirements for an authorized chemical worker. Individuals with appointments of less than one year, visitors, undergraduate and high school students will not be chemical owners. The immediate supervisor for visitors, undergraduates and high school students will be the chemical owner.
- Post work areas with signs or placards that depict the current chemical hazards in the area. Labels, signs, and placards will be consistent with the group's written plan (HAZCOM or CHP).
- Label chemical containers with required information. See Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan,* Section 1.5.
- Working with the WMC, establish whether the chemical or its end product will require disposal as a hazardous waste, New Mexico Special Waste, or has other disposal requirements.
- To the greatest extent possible, purchase chemicals on an as-needed basis and limit the purchase quantity to an amount that will be used in six months or less, to minimize inventory and chemicals in storage. If possible purchase reagents in polyethylene bottles or plastic-coated glass bottles to minimize breakage, corrosion, and rust. Ensure that the amount purchased does not exceed safety basis or flammable or combustible liquid storage limits.
- Be aware of chemical incompatibilities and store chemicals accordingly.

4.10 Authorized Chemical Workers

- Work safely by observing safety standards, guidelines, and procedures.
- Implement all controls required by work authorization documentation.
- Stop work that may pose an imminent danger to workers.
- Work with DSESH deployed personnel in workplace monitoring and sample collection.
- Report unsafe conditions, chemical incidents, or injuries to line managers immediately.
- Call 911 immediately if a chemical-related illness or injury occurs.
- Be familiar with and follow chemical and emergency procedures as directed in work authorization documentation.

- Label chemical containers with required information. See Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan,* Section 1.5.
- Complete required training and ensure receipt and understanding of job-specific information on the chemical hazards and safety precautions related to assigned work, before beginning work. (See Section 6.0.)

5.0 IMPLEMENTATION

The requirements in this document are effective on the issue date.

6.0 TRAINING

Job-specific and site-specific information provided will be documented in the activity specific IWD. Training and briefings will use a graded approach so that each increasing level of risk associated with the safe use of chemicals is addressed. Job-specific information will include other topics such as MSDS/SDSs, labeling, emergency equipment, chemical spill control/mitigation/cleanup, process chemistry, process control, chemical storage, hazardous material regulations for chemical packaging, waste identification and disposal, pollution prevention, and waste minimization. Training and briefings will include methods that will be used to detect the presence or release of chemicals and measures workers can implement to protect themselves from chemical hazards.

RLMs will work with FOD personnel to ensure that workers are informed of the hazards when non-routine tasks are performed in the work area by maintenance or subcontract workers, and work with FOD personnel to inform subcontractors and visitors of the hazards in the building.

Required training for chemical workers, along with the regulatory reference is as follows:

- Course #21464 or equivalent, which includes how to detect hazards, how to interpret an MSDS/SDS, and labeling requirements, in accordance with 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication* (h) (2-3) and 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories* (f) (3-4).
- Facility-specific hazard information, in accordance with 29 CFR 1910.1450 (f).
- Awareness briefing on operation and building chemical inventory, how to obtain an MSDS/SDS, secondary container labeling requirements, building signs and postings, building emergency plans, written program documents, location of eyewashes and safety showers, spill response, and chemical storage requirements in accordance with 29 CFR 1910.1200 (h) (1-3) and 29 CFR 1910.1450 (f).
- Level 1 On-the-Job Training (Level 1 formality of training requires trainee to read, observe/walk through, and self-assess/sign the communication document) or pre-job briefing on specific chemical hazards, procedures, and PPE and review the hazard analysis documentation (for moderate and high-level hazard IWDs) authorized by his/her RLM/PIC for the job assignment every time a worker receives a new job assignment or a new hazard is introduced into the current assignment in accordance with 29 CFR 1926.21, *Labor, Safety and Health Regulations for Construction, Safety Training and Education* (b), 29 CFR 1910.1450 (f) (3), and 29 CFR 1910.1003, *Labor, Occupational Safety and Health Standards, 13 Carcinogens*.
- If a chemical worker will be generating waste, Course #23263 *Waste Generation Overview Live*, and Course #21464, *Waste Generation Overview Refresher*, every three years, in accordance with 40 CFR 262, *Protection of Environment, Standards Applicable to Generators of Hazardous Waste*.

- If a chemical worker will be using gas, Course #769, *Pressure Safety Orientation,* and Course #9518, *Gas Cylinder Safety*.

7.0 EXCEPTION OR VARIANCE

To obtain an exception or variance to this document, see the following instructions:

- Managers may request an exception or variance from the IA through the RM;
- At the IA's request, the RM will provide a recommendation or supporting information; and
- The IA or designee will provide the requester with a written response and copy the RM.

The requesting organization must maintain the official copy of record of the approved correspondence granting the exception or variance.

8.0 DOCUMENTS AND RECORDS

8.1 Office of Record

The Policy Office is the Laboratory Office of Record for this Institutional Document and maintains the administrative record.

9.0 DEFINITIONS AND ACRONYMS

9.1 Definitions

See LANL *Definition of Terms*.

Accident—Any event, including, but not limited to, equipment failure, rupture of containers, or failure of engineering controls, that potentially creates a hazard through uncontrolled release of a hazardous chemical.

Authorized Chemical Worker—A worker (Los Alamos National Security, Limited Liability Company [LANS, LLC or LANS], contractor, subcontractor, student) whose RLM and PIC have determined that he/she has the training, skill, knowledge, and abilities to safely perform the chemical work to which he/she is assigned.

Carcinogen—Those chemicals that have been identified as substances that can lead to cancer by the agencies listed below and that have a concentration equal to or greater than 0.1% (1,000 parts per million).

- American Conference of Governmental Industrial Hygienists (ACGIH), either Category A1 (confirmed human carcinogen) or Category A2 (suspected human carcinogen).
- Compounds that the International Agency for Research on Cancer (IARC) has confirmed or identified as possible human carcinogens and those chemicals that the National Toxicology Program (NTP) has identified as known to be carcinogenic or chemicals that may reasonably be expected to be carcinogenic.

Chemical—Any element, compound, or mixture of elements and compounds. A substance that (1) possesses potentially hazardous properties (including, but not limited to, flammability, toxicity, corrosivity, reactivity, and instability); or (2) is included on any Federal, state, or local agency regulatory list; or (3) is associated with a MSDS/SDS. For the purposes of this document, this definition also applies to chemical products.

Chemical Hygiene Officer (CHO)—(CHP areas only). An employee, appointed by the Division Leader, who is qualified by training or experience to provide technical guidance in the development and implementation of the provisions of the LANL Hazard Communication and Chemical Hygiene Plan (see Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan*).

Chemical Hygiene Plan (CHP)—A written program that consists of the Laboratory's CHP (see Attachment A, *LANL Hazard Communication and Chemical Hygiene Plan*) and activity-specific documentation, such as IWDs, which set forth guidance to protect workers from the dangers presented by hazardous chemicals used in a particular laboratory work area.

Chemical Inventory—A written or electronic record of chemicals.

Chemical Owner—An authorized chemical worker to whom a container that contains a chemical on the chemical inventory is assigned.

Chemical Release—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a chemical into the environment.

Chemical Worker—A worker who works with hazardous chemicals.

Corrosive—A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. A substance or a mixture that by chemical action will materially damage, or even destroy, metals is termed "corrosive to metal." See 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication,* Appendix A.

Designated Area—An area that will be used for work with LANL Cat 1 chemicals and to which access is administratively restricted to authorized personnel.

Emergency Response—A response made by workers from outside the immediate release area or by other designated emergency responders (i.e., SEO-EM, the Los Alamos County Fire Department and the Hazardous Materials Response Group) to an occurrence that results, or is likely to result, in an uncontrolled release of a hazardous substance.

Environment, Safety, and Health (ESH) Qualified Person—An employee who has academic credentials or work experience in a relevant discipline, such as industrial hygiene or industrial safety, who has experience or training in conducting workplace exposure monitoring and in determining the hazards and consequences of exposure to chemicals.

Extremely Hazardous Substance— Any of 366 (+ or -) chemicals or hazardous substances identified by EPA on the basis of hazard or toxicity and listed under EPCRA. The list is periodically revised. See 40 CFR Part 355.

Explosive—A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Flammable Liquid Storage Cabinet—A cabinet for the storage of flammable and combustible liquids constructed in accordance with Section 9.5 of NFPA 30, *Flammable and Combustible Liquids Code*.

Hazard Communication (HAZCOM) Plan—A written program developed and implemented by the Laboratory or subcontractor, which consists of requirements listed in Attachment A, *LANL*

Hazard Communication and Chemical Hygiene Plan, and activity-specific documentation such as IWDs, or operating procedures that set forth requirements to protect workers from the dangers presented by hazardous chemicals used in a specific construction or production work area.

Hazardous Chemical—Any chemical that presents a physical hazard or a health hazard (health hazard defined below). If a hazardous chemical comprises 1% (0.1% for carcinogens) or greater of a compound or mixture, the compound or mixture will be treated as a hazardous chemical. See 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication* (g) (2) (i) (c) (*1*).

Hazardous Waste—A solid waste that is not excluded from regulation as a hazardous waste and is a listed hazardous waste or exhibits any of the hazardous characteristics: ignitibility, corrosivity, reactivity, or toxicity.

Health Hazard—A chemical that is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in 29 CFR 1910.1200. Appendix A, *Health Hazard Criteria* having an NFPA rating of 2, 3, or 4 under fire conditions.

High Acute Toxicity—Substances that may be fatal or cause clinical damage to target organs as a result of a single exposure or exposures of short duration. High-acute-toxicity chemicals meet the following criteria: a Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) of less than 0.1 ppm Time-Weighted Average (TWA) or ceiling limit of less than 1.0 ppm.

High Chronic Toxicity—Refers to substances that produce adverse effects in humans who suffer repeated exposures to those substances over a relatively prolonged period.

Immediate Use—The hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Irritant—A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

Laboratory Scale—Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safety manipulated by one person.

Laboratory Produced Material—A chemical or chemical mixture that is manufactured or synthesized by an operating group at the Laboratory.

LANL Category 1 Chemical (LANL Cat 1)—A Laboratory designation identifying specific chemicals that are regulated at the Laboratory and that require the chemical worker to follow special provisions. LANL Cat 1 chemicals are known human carcinogens, chemicals of high acute or high chronic toxicity, and/or known human reproductive toxins. Lists are available at the Chemical Safety Webpage. ***Note:*** The Globally Harmonized System (GHS) used in the update for 29 CFR 1910.1200 uses the term hazard category: the division of criteria within each hazard class. GHS hazard category 1 has specific criteria for each hazard class.

Legacy Chemical—A stable, non-time-sensitive stock chemical or chemical mixture being held for evaluation for future use. Note: Per EPA [40 CFR 261.2(a) (2) and 261.33], unused commercial chemical products do not become solid wastes (i.e., they remain commercial chemical products) until a determination is made that the material will be discarded. Commercial chemical products, even those whose shelf life has been exceeded, that ultimately will be used for their intended purpose or that will be reclaimed are not subject to the Resource Conservation and Recovery Act (RCRA). In 2006 [71 FR 29719; May 23, 2006], EPA noted the following for laboratory chemicals "when accumulated for long periods of time, for example, such unused reagents may be considered solid or hazardous wastes if it can be determined that they are no longer usable for their intended purpose."

Material Safety Data Sheet/Safety Data Sheet (MSDS/SDS)—Written, printed, or electronically transmitted information on the hazards and properties of a particular material, including instructions for its safe use.

Mutagen—A chemical that induces DNA damage and genetic alterations that range from changes in one or a few DNA base pairs to gross changes in chromosome structure.

Occupational Exposure Limit (OEL)—The upper limit on the acceptable concentration of a hazardous substance in workplace air for a particular material or class of materials. LANL OELs include OSHA PELs (8-hour time weighted average), and Ceiling Values; ACGIH Threshold Limits Values (Threshold Limit Value-Time-Weighted Average [TLV-TWA], Threshold Limit Value-Short-Term Exposure Limit [TLV-STEL], and Threshold Limit Value-Ceiling [TLV-C]), or other appropriate OELs.

Occupational Safety and Health Administration Permissible Exposure Limit—regulatory limits on the amount or concentration of a substance in the air. They may also contain a skin designation. OSHA PELs are based on an 8-hour TWA exposure.

Physical Hazard—A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. *See* 29 CFR 1910.1200, Appendix B, *Physical Hazard Criteria*.

Production—An operation in which large quantities of a limited list of hazardous chemicals are used on a routine basis for synthesis, product manufacture, product preparation, dip tank or painting, solvent cleaning, photographic development, mechanical shops, construction, or maintenance activities.

Regulated Area—An area where entry and exit is restricted and controlled.

Reproductive Toxicants (known human)—Substances that are known to have lethal effects on the fertilized egg, developing embryo, or fetus, or to cause teratogenesis (malformation) in the fetus.

Secondary Container—Any chemical container other than an original container that will be used to store decanted chemicals or mixed chemicals beyond a single workday.

Note: This definition should not be confused with secondary containment for chemical release prevention and control.

Sensitizer—A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Short-Term Exposure Limit (STEL)—A 15-minute time weighted average that should not be exceeded at any time during a work day.

Solid Waste—As defined by regulations promulgated under RCRA and the New Mexico Hazardous Waste Act, unless otherwise excluded, is any discarded material, either abandoned, recycled, or inherently waste-like, including liquids, solids, semisolids, and contained gases.

Spill—An unintentional release of a hazardous chemical, liquid, or solid that creates a hazard because of quantity, physical properties, or toxicity.

Subcontractor—A party entering into a contract with LANS, LLC.

Threshold Limit Value (TLV)—An ACGIH limit that is usually expressed as an 8-hour TWA, meaning a time-weighted airborne contaminant concentration for a normal 8-hour workday and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse effect.

Time Sensitive Chemicals—Those chemicals that, when stored for prolonged periods or under improper storage conditions, can develop hazards that were not present in the original formulation. There are four general categories of time-sensitive chemicals loosely based on those unsafe properties that can develop. They are (1) peroxide formers, (2) peroxide formers that can undergo hazardous polymerization, (3) materials that become shock or friction sensitive upon the evaporation of a stabilizer, and (4) materials that generate significant additional hazards by undergoing slow chemical reactions. It should be noted that time-sensitive chemicals can be pure reagents or they can be commercial mixtures formulated as cleaners, adhesives, and other products. ***Note:*** This definition does not include chemicals that have expiration dates for nonsafety reasons, e.g., inorganic standard solutions that expire 1 year from purchase.

Toxicant—A material that has the ability to injure biological tissue.

Toxicity—A relative property of a chemical agent that refers to a harmful effect on some biologic mechanism and the condition under which this effect occurs.

9.2 Acronyms

See LANL *Acronym Master List*.

ACGIH	American Conference of Governmental Industrial Hygienists
ADESH	Associate Director for Environment, Safety, Health
ADNHHO	Associate Director for Nuclear and High Hazard Operations
ANSI	American National Standards Institute
ASM	Acquisition Services Management
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
CTS	Comprehensive Tracking System
D&D	Decontaminate and Decommission
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy

DOT	Department of Transportation
DPR	Designated Procurement Representative
DSESH	Deployed Services Environment, Safety, and Health
ENV-ES	Environmental Protection-Environmental Stewardship
EO-EPP	Emergency Operations-Emergency Planning and Preparedness
ESH	Environment, Safety, Health
FOD	Facility Operations Director
FP-DO	Fire Protection-Division Office
GHS	Globally Harmonized System
HAZCOM	Hazard Communication
HDBK	Handbook
HEPA	High-Efficiency Particulate Air
IA	Issuing Authority
IARC	International Agency for Research on Cancer
ISEA	International Safety Equipment Association
IWD	Integrated Work Document
IWM	Integrated Work Management
LANL or the Laboratory	Los Alamos National Laboratory
LAMC	Los Alamos Medical Center
LANS, LLC or LANS	Los Alamos National Security, Limited Liability Company
MAQ	Maximum Allowable Quantity
MOV	Management Observation and Verification
MSDS/SDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OM	Occupational Medicine
OS	Operations Support (Division)
OS-DO	Operations Support-Division Office
OSHA	Occupational Safety and Health Administration
OSH-ISH	Occupational Safety and Health-Industrial Safety and Hygiene
OSH-OM	Occupational Safety and Health-Occupational Medicine
OS-PT	Operations Support-Packaging and Transportation
OST	Operations Support Tool
PEL	Permissible Exposure Limit
PFITS	Performance Feedback and Improvement Tracking System
PIC	Person in Charge
PPE	Personal Protective Equipment
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
RLM	Responsible Line Manager

RM	Responsible Manager
RO	Responsible Office
SBP	Safety Basis Procedure
SME	Subject Matter Expert
STEL	Short-Term Exposure Limit
STR	Subcontract Technical Representative
TA	Technical Area
TLV	Threshold Limit Value
TLV-C	Threshold Limit Value-Ceiling
TLV-STEL	Threshold Limit Value-Short-Term Exposure Limit
TLV-TWA	Threshold Limit Value-Time-Weighted Average
TWA	Time-Weighted Average
USI	Unreviewed Safety Issue
USQ	Unreviewed Safety Question
WMC	Waste Management Coordinator

10.0 HISTORY

Revision History		
04/22/08	P101-14, Rev. 0	Renumbered document, ISD 101-14, *Chemical Management*.
04/15/09	P101-14, Rev. 1	Reformatted to meet the requirements as set forth in P311-1, *Creating, Revising, and Cancelling Institutional Documents*. Updated to address needs identified by the Chemical Management Improvement Project, driven by a Black Belt Project Execution Plan, and captured in Laboratory Issues Management Tracking System (LIMTS). The need to provide a more user friendly chemical inventory process, and tools to Designated Procurement Representatives (DPRs) and chemical workers is addressed. As part of the provision of a more user friendly chemical inventory process, drivers based on compliance requirements for chemical management were identified. Divisions responsible for these compliance requirements provided additional requirements for chemical inventory management and tracking, which are now reflected in a Chemlog functional requirements document. The set of requirements is provided in Section 3.3 of the document. There are no new requirements in this document, but the document has been simplified and updated, including combining the Hazard Communication (HAZCOM) plan and the Chemical Hygiene Plan (CHP) into one attachment.
08/11/10	P101-14, Rev. 2	Issued as a PROVISIONAL document until October 11, 2010. Added a requirement to ensure compliance with 29 Code of Federal Regulations (CFR) 1910.119, *Labor, Occupational Safety and Health Standards, Process Safety Management of Highly Hazardous Chemicals (OSHA PSM Rule),* Appendix A. by requiring Facility Operations Directors (FODs) to ensure that quantities are kept below threshold

Revision History		
		quantities. Updated responsibilities for chemical inventory to reflect ownership by Emergency Operations-Emergency Planning and Preparedness (EO-EPP). Clarified training requirements for “authorized chemical workers” and explained the training requirements for a worker who performs chemical spill/control/mitigation/cleanup. Added a requirement that work involving hazardous chemicals is reviewed using a new activity review process or equivalent process. Clarified the requirement for Chemical Hygiene Officers (CHOs), added the requirement that CHOs are assigned by the Division Leader, and added training and responsibilities for CHOs. Added specific requirements for job-specific briefings and/or information. Added the requirement for evaluation of chemicals and chemical reactions before start of laboratory activities.
10/11/10	P101-14, Rev. 2	Document became effective and is no longer PROVISIONAL.
11/30/10	P101-14, Rev. 3	Updated links to ensure correct names; removed irrelevant, incorrect, or duplicative links. Section 3.2: Elimination of a requirement for DPRs and clarification of chemical owner responsibility for procurement. Reducing requirement for justification of keeping chemical containers from six months to five years.
11/30/11	P101-14, Rev. 4	Updated items in Section 3.2 to consider before a chemical is purchased and provided link to list of chemicals with no disposal path. Changed Form 2134, *Medical Surveillance and Medical Certification Program Enrollment Form*, to Form 1793, *Job-Demands Evaluation*. Changed Chemical Management Webpage to Chemical Management Webpage. Updated Section 5.0 to reflect that this Quick Change does not require an Unreviewed Safety Question/Unreviewed Safety Issue (USQ/USI) review. Updated links, titles, and acronyms.
09/27/12	P101-14, Rev. 5	Section 5.0: Updated to reflect effective date of December 17, 2012 for applicable nuclear, high- and moderate-hazard facilities and accelerators. Removed the requirement for the approval by the Person in Charge (PIC) for the applicable Integrated Work Document (IWD). Updated links, titles, and acronyms.
01/08/15	P101-14, Rev. 6	This document cancels PD100, *Occupational Safety and Health*. Performed three-year review in accordance with PD311,

Revision History		
		Requirements System and Hierarchy. Changed the Issuing Authority (IA) from Associate Director for Environment, Safety, and Health (ADESH) to Associate Director for Nuclear and High Hazard Operations (ADNHHO); changed the Responsible Manager (RM) from Industrial Hygiene and Safety Division Leader to Operations Support (OS) Division Leader; and changed the Responsible Office (RO) from Industrial Hygiene and Safety Division to Operations Support-Division Office (OS-DO). Addressed revised Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, now aligned with the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. Clarified requirements for Chemical Hygiene Officers. Reinserted requirements for chemical inventory. Added new requirements in 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication*. Added requirements for handling of sharps. Clarified and streamlined other chemical management requirements. Revised language in Section 5.0 to reflect Unreviewed Safety Question/Unreviewed Safety Issue (USQ/USI) process and implementation dates for affected facilities. Updated acronyms, links, and organization names. Made other edits and clarifications to resolve vague or inappropriate wording.
08/06/15	P101-14, Rev. 7	Performed three-year review in accordance with PD311, *Requirements System and Hierarchy*. Throughout document: Changed "Chemlog@lanl.gov" to "ChemDB@lanl.gov." Section 1.0: Changed the name from "Hazardous Materials Lifecycle Management Program" to "Chemical Lifecycle Management Program." Section 3.3: Changed how to barcode, enter, and track to the "Support and Resources" tab in the LANL institutional chemical inventory database application. Section 5.0: Updated this section to read, "The requirements in this document are effective on the issue date." Section 6.0: Updated broken link to UTrain course # 25418. Attachment A, Section 1.3: Removed sentence referencing Tools #9. Updated hyperlinks and references.

11.0 REFERENCES

Prime Contract:

- Clause I-121, Department of Energy Acquisition Regulation (DEAR) 970.5203-1, *Management Controls* (Dec. 2000)
- Clause I-122, DEAR 970.5203-3, *Contractor's Organization* (Dec. 2000) (Deviation)
- Clause I-123, DEAR 970.5204-2, *Laws, Regulations, and DOE Directives* (Dec. 2000) (Deviation)
- DEAR 970.5223-1, *Integration of Environment, Safety and Health into Work Planning and Execution*
- DEAR 970.5204-2, *Laws, Regulations, and DOE Directives; Appendix B 4.2, Environment, Safety, and Health*
- 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication*
- DOE O 151.1C, *Comprehensive Emergency Management System*

11.1 Other References

- 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories*
- 29 CFR 1926.59, *Labor, Safety and Health Regulations for Construction, Hazard Communication*
- P101-29, *Working with Nanotechnology Materials and Processes*
- P101-15, *Biological Safety*
- P101-8, *Explosives Safety*
- P121, *Radiation Protection*
- 29 CFR 1910.119, *Labor, Occupational Safety and Health Standards, Process Safety Management of Highly Hazardous Chemicals (OSHA PSM Rule),* Appendix A
- MSDS/SDS electronic binder
- Designated Procurement Representative (DPR)
- LANL institutional chemical inventory
- 10 CFR 1021, *Energy, National Environmental Policy Act Implementing Procedures*
- 40 CFR 355, *Protection of Environment, Emergency Planning and Notification*
- NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*
- P300, *Integrated Work Management*
- P101-32, *Worker Exposure Assessments*
- NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*
- Research Library
- P101-34, *Pressure Safety*
- NFPA 55, *Compressed Gases and Cryogenic Fluids Code*

- P409, *LANL Waste Management*
- P151-1, *LANL Packaging and Transportation Program Procedure*
- 49 CFR 100–185, *Transportation, Pipeline and Hazardous Materials Safety Administration, Department of Transportation*
- 49 CFR 171.8, *Transportation, General Information, Regulations, and Definitions, Definitions and Abbreviations*
- 49 CFR 173, *Transportation, Shippers—General Requirements for Shipments and Packagings, Parts 115–141 and Parts 403–436*
- SOP-C-DO-003, *On-Site Shipping of Analytical-Scale Samples of Hazardous or Radioactive Materials (DOT Small Quantities)*
- SBP 112-3, *Unreviewed Safety Question (USQ) Process*
- 29 CFR 1926.21, *Labor, Safety and Health Regulations for Construction, Safety Training and Education*
- 29 CFR 1910.1003, *Labor, Occupational Safety and Health Standards, 13 Carcinogens*
- 40 CFR 262, *Protection of Environment, Standards Applicable to Generators of Hazardous Waste*
- NFPA 30, *Flammable and Combustible Liquids Code*
- P311-1, *Creating, Revising, and Cancelling Institutional Documents*
- PD311, *Requirements System and Hierarchy*
- P101-21, *Chronic Beryllium Disease Prevention Program*
- Laboratory Industrial Hygiene and Safety Manual
- P101-16, *Local Exhaust Ventilation and HEPA Filtration Systems*
- American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) z358.1-2009, *American National Standard for Emergency Eyewash and Shower Equipment*
- LANL Operations and Maintenance Manual, Criterion 407: Emergency Eyewash and Shower Equipment
- LANL Category 1 Chemicals list
- P101-19, *Safety Signs, Labels, and Tags*
- P101-6, *Personal Protective Equipment*
- PD1200, *Emergency Management*
- P102, *Occupational Medicine*
- 10 CFR 851, *Energy, Worker Safety and Health Program*
- *Montreal Protocol on Substances that Deplete the Ozone Layer*
- Public Law 101-549, *Clean Air Act Amendments of 1990*
- 29 CFR 1910 Subpart Z, *Labor, Occupational Safety and Health Standards, Toxic and Hazardous Substances*
- 29 CFR 1910.1020, *Labor, Occupational Safety and Health Standards, Access to Employee Exposure and Medical Records*

- 40 CFR 61, *Protection of Environment, National Emission Standards for Hazardous Air Pollutants*
- 40 CFR 63, *Protection of Environment, National Emission Standards for Hazardous Air Pollutants for Source Categories*
- 40 CFR 68, *Protection of Environment, Chemical Accident Prevention Provisions*
- 40 CFR 82, *Protection of Environment, Protection of Stratospheric Ozone*
- 40 CFR 261, *Protection of Environment, Identification and Listing of Hazardous Waste*
- 40 CFR 263, *Protection of Environment, Standards Applicable to Transporters of Hazardous Waste*
- 40 CFR 268, *Protection of Environment, Land Disposal Restrictions*
- 40 CFR 302, *Protection of Environment, Designation, Reportable Quantities, and Notification*
- 40 CFR 370, *Protection of Environment, Hazardous Chemical Reporting: Community Right-to-Know*
- 40 CFR 372, *Protection of Environment, Toxic Chemical Release Reporting: Community Right-to-Know*
- 40 CFR 700–799, *Protection of Environment, Toxic Substances Control Act*
- 49 CFR, *Transportation*
- NFPA 430, *Code for the Storage of Liquid and Solid Oxidizers*
- NFPA 432, *Code for the Storage of Organic Peroxide Formulations*
- NFPA 484, *Standard for Combustible Metals*
- *Compressed Gas Association (CGA) Publications*
- 49 CFR 171-180, *Transportation, Hazardous Materials Regulations*
- DOE-HDBK (Handbook)-1139/2-2006, *Chemical Management (Volume 2 of 3), Chemical Safety and Lifecycle Management*
- DOE-HDBK-1139/3-2003, *Chemical Management (Volume 3 of 3), Consolidated Chemical User Safety and Health Requirement*s
- P313, *Roles, Responsibilities, Authorities, and Accountability*
- P301, *Research Sample Management for Quality R&D*

12.0 FORMS

There are no forms associated with this document.

13.0 ATTACHMENTS

Attachment A. *LANL* Hazard Communication and *Chemical Hygiene Plan*

14.0 CONTACTS

Chemical Management: ADNHHO Operations Support (OS) Division
Telephone: (505) 665-5550
Website: http://int.lanl.gov/org/padops/adnhho/operations-support/index.shtml

Chemical Safety: Occupational Safety and Health Division
Telephone: (505) 606-0295

Website: http://int.lanl.gov/org/padops/adesh/occupational-safety-and-health/index.shtml

No: P101-14 Chemical Management
Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Page 1 of 12)

1.0 INTRODUCTION

A Chemical Hygiene Plan (CHP) is required by 29 Code of Federal Regulations (CFR) 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories*, which applies to facilities where multiple chemicals are used in laboratory scale quantities or Research and Development (R&D). A written Hazard Communication (HAZCOM) Plan is required by 29 CFR 1910.1200, *Labor, Occupational Safety and Health Standards, Hazard Communication,* and 29 CFR 1926.59, *Labor, Safety and Health Regulations for Construction, Hazard Communication*, which apply to workers who use chemicals in shops, maintenance activities, construction or facility work, product manufacture, laboratory analysis, environmental restoration, or decommissioning activities. This attachment covers both standards. Areas where only one standard applies will be noted in the text.

Personnel exposure to chemical agents is to be minimized, and maintained within acceptable exposure limits. Exposures will be minimized by the use of hazard elimination, hazard substitution, engineering controls, administrative controls, and Personal Protective Equipment (PPE). Every employee, guest, visiting scientist, student, or subcontractor working on or off-site will be familiar with and comply with appropriate Los Alamos National Laboratory (LANL or the Laboratory) safety standards.

This plan includes:

- procedures to be followed when work involves the use of hazardous chemicals,
- criteria used to determine and implement control measures to reduce employee exposure to hazardous chemicals through the Integrated Work Management (IWM) and Worker Exposure Assessment processes,
- methods used to inform workers of non-routine tasks and hazards associated with chemicals in unlabeled pipes through the IWM process,
- requirements for:
  - fume hoods and other protective equipment,
  - employee information and training,
  - authorization and approval of activities through the IWM process,
  - additional employee protection for work with particularly hazardous substances in accordance with 29 CFR 1910.1450,
  - a hazardous chemical listing, and
  - subcontractor personnel in terms of HAZCOM.

1.1 Purpose

The purpose of this Hazard Communication and Chemical Hygiene Plan is to provide workers with the specific requirements for chemicals used during work, the hazards involved, the forms of warning, Material Safety Data Sheets/Safety Data Sheets (MSDS/SDSs), and the procedures and work practices to minimize their exposure to those chemicals.

No: P101-14 Chemical Management
Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 2 of 12)

1.2 Scope

HAZCOM applies to the use of chemicals in shops, maintenance activities, construction or facility work, product manufacture, the use of chemicals in a process in excess of 40 pounds or 5 gallons (see 40 CFR 355, *Protection of Environment, Emergency Planning and Notification*), environmental restoration, or decommissioning activities.

The CHP applies to work with small quantities of chemicals where the work can be safely manipulated by one person and multiple chemical procedures or multiple chemicals are used.

1.3 Chemical Inventory Requirements

A list of the hazardous chemicals known to be present at the Laboratory is maintained in the LANL institutional chemical inventory database. Primary hazardous chemical containers must be barcoded, and entered and tracked in the database.

Note: Most primary hazardous chemical containers ordered through standard purchasing agreements will be delivered to the user with a barcode and will already be listed in the LANL institutional chemical inventory database.

The chemical owner is responsible for ensuring the entry was accurately made in the chemical inventory database (e.g., owner, name of chemical, location). Some hazardous chemical containers (e.g., P-card purchases) may be delivered without a barcode and absent from the chemical inventory database. Chemical owners are responsible for barcoding these containers and entering them into the chemical inventory database. When a primary hazardous chemical container is transferred to a new owner and/or a new location; or is disposed, the chemical owner is responsible for updating the database.

Responsible Line Managers (RLMs) are accountable for accurate chemical inventories and are responsible for ensuring that physical inventories of their primary hazardous chemical containers are performed annually to verify the database inventory.

Note: Accuracy of the Laboratory's chemical inventory is very important. For example, in accordance with 40 CFR 370, *Protection of Environment, Hazardous Chemical Reporting: Community Right-to-Know*, "The owner or operator or the officially designated representative of the owner or operator must certify that all information included in the Tier II submission is true, accurate, and complete…under penalty of law... " The accuracy of the Laboratory's Tier II submittal (annual hazardous chemical report) is dependent on the accuracy of the Laboratory's chemical inventory.

For assistance with the LANL institutional chemical inventory database, contact the help desk at 667-9242, or e-mail ChemDB@lanl.gov.

1.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDSs)

Access to MSDS/SDSs is provided through a link on the Chemical Safety Webpage.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 3 of 12)

- For chemicals acquired prior to December 1, 2015: MSDSs are available for all hazardous chemicals and hazardous chemical mixtures in the LANL institutional chemical inventory database (see the Chemical Safety Webpage) through the LANL MSDS/SDS database, or if specific manufacturer MSDS/SDSs are not available, refer to the Laboratory Chemical Safety Webpage for commercial MSDS/SDS databases.
- For chemicals acquired after December 1, 2015, or for chemicals for which an SDS has been created: SDSs, are available for all hazardous chemicals and hazardous chemical mixtures in the LANL institutional chemical inventory database (see the Chemical Safety Webpage) through the LANL MSDS/SDS database, or if specific manufacturer SDSs are not available, refer to the Laboratory Chemical Safety Webpage for commercial MSDS/SDS databases.

Manufacturer's MSDS/SDSs are provided to Industrial Safety and Hygiene (ISH) as part of the I-procurement process. If a chemical owner has acquired the chemical through another process, the manufacturer's MSDS/SDS will be provided to ISH.

Note: This does not apply to samples being submitted for analysis.

New chemicals developed at the Laboratory for internal use will be evaluated by the chemical owner to determine if they are hazardous (CHP only). If it is determined the chemicals are hazardous, the information will be included in the Integrated Work Document (IWD), thus allowing for the chemical workers to receive information on how to control the hazard. If the chemical produced is a byproduct whose composition is not known, the chemical will be assumed to be hazardous and handled accordingly. If an employee produces a new chemical, and plans to ship it off-site for use or distribution, an MSDS/SDS is required to be created and shipped with the chemical. For chemicals created at the Laboratory, ISH will be contacted for assistance in creating an MSDS/SDS.

1.5 Labels

Labels on containers, including, but not limited to, tanks, totes, piping and drums must be maintained. This means that labels must be maintained on chemicals in a manner which continues to be legible and the pertinent information (such as the hazards and directions for use) does not get defaced (i.e., fade, get washed off) or removed in any way.

Note: All hazardous chemicals shipped after June 1, 2015, must be labeled with specified elements including pictograms, signal words and hazard and precautionary statements. However, manufacturers, importers, and distributors may start using the new labeling system in the revised HCS before the June 1, 2015 effective date if they so choose. LANL is not responsible for updating labels on shipped containers, even if the shipped containers are labeled under the 1994 Hazard Communication Standard, unless the labels have been removed or defaced. However, if there are newly-identified hazards that are not disclosed on the label, RLMs and PICs must ensure that the workers are aware of the hazards as discussed below under workplace labels.

Primary chemical containers associated with the 1994 Hazard Communication Standard will have a label with the chemical name, and hazard warning. The hazard warning is a statement of the hazardous effect of the chemical (e.g., "flammable" or "causes lung damage") or a numerical rating such as that found on the NFPA label.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 4 of 12)

(CHP areas only) When one transfers a material from the original manufacturer's container to other vessels, these vessels are referred to as "secondary containers." Secondary containers in HAZCOM areas will include the chemical name, creation date, hazard warning, and manufacturer. Secondary containers in CHP areas will include the name of the chemical, date created, and the owner of the container.

Portable containers into which hazardous chemicals are transferred and which are intended only for the immediate use (i.e., use by one worker for one day, and always under the control of that one worker) of the chemical worker who performed the transfer are not required to be labeled. However, it is good practice to label the container with the name of the chemical and the owner.

Contact the CHO and OSH-ISH for assistance in developing labels

1.6 Methods Used to Inform Workers

Workers use the IWM process (see P300, *Integrated Work Management*) to develop IWDs for the proposed work activity. The IWD or other work document describes the scope, location, duration, hazards and environmental aspects, and controls (including PPE) to mitigate the hazards and negative environmental impact of the work. The IWD is used to authorize the work in accordance with P300. IWDs or other work documents will be used to address tasks involving hazardous chemicals.

Responsible Line Managers (RLMs) will ensure that all work involving hazardous chemicals is reviewed for impacts on security, environment, safety and health, facility or equipment, and facility safety basis concerns in accordance with P300. At a minimum, the following steps will be performed:

1. Initially categorize hazardous chemical work in accordance with P300. If categorized as high hazard/complex work, assemble a hazard analysis review team (see P300 Appendix A, *Integrated Work Management Process for Research and Development*). In addition to the required members for the team, include deployed industrial hygienist(s), and other hazardous chemical Subject Matter Experts (SMEs).
2. Create a detailed description of the work for the IWD involving hazardous chemicals that identifies the hazards associated with performing the work.
3. Specify hazard controls within the IWD using the following hierarchy of controls.
   a. Elimination or Substitution
   b. Engineering Controls
   c. Administrative Controls
      - qualifications
      - formal procedures
      - training
      - work practices

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 5 of 12)

d. PPE

Note: Guidance for Preparing IWDs: Consider and understand the potential for generating new hazardous chemical-bearing waste streams. Consider substituting a less hazardous chemical and speak with your Waste Management Coordinator (WMC) before creating new waste streams.

4. Contact your deployed industrial hygienist to perform a qualitative exposure assessment in accordance with the Laboratory Industrial Hygiene and Safety Manual to evaluate the potential for worker exposure to hazardous chemicals.

Your deployed industrial hygienist will work with subcontractor personnel to ensure that the potential for subcontractor worker exposure to hazardous chemicals is evaluated before removing, remodeling, servicing, maintaining, or repairing laboratory equipment and exhaust systems.

1.7 Worker Exposure Assessments

Worker exposure assessments, including exposure monitoring, will be conducted in accordance with applicable sections of:

- P101-21, *Chronic Beryllium Disease Prevention Program*
- P101-32, *Worker Exposure Assessments*
- the Laboratory Industrial Hygiene and Safety Manual

1.8 Use and Maintenance of Laboratory Fume Hoods

Requirements that will be followed for the proper design, operation, and use of laboratory fume hoods are located in P101-16, *Local Exhaust Ventilation and HEPA Filtration Systems*.

1.9 Chemical Hygiene Officer (CHO) (Chemical Hygiene Plan [CHP] Only)

The LANL CHO resides in OSH-ISH. Each Division Leader will appoint a CHO to provide technical guidance to line management and chemical workers (CHP only). The CHO will be an authorized chemical worker with the education and experience to determine the hazards and consequences of exposure to the chemicals found in the chemical inventory.

1.9.1 Roles and Responsibilities (Based on 29 CFR 1910.1450*, Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories, Appendix A [nonmandatory] and Prudent Practices for Handling Hazardous Chemicals in Laboratories)*

LANL CHO:

- Establish, maintain, and revise the CHP.
- Create and revise CHP documentation.
- Communicate chemical safety lessons learned to Division CHOs for dissemination.

Division CHO:

- Liaise with OSH-ISH to ensure compliance with this document.
- Monitor procurement, use, and disposal of chemicals used in the Division.
- Seek ways to improve the LANL Hazard Communication and Chemical Hygiene program.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 6 of 12)

- Perform MOVs with Division management of laboratories, preparation rooms, and chemical storage rooms.
- Assist laboratory owners in developing and maintaining adequate facilities.
- Provide assistance to Division members for proposed research activities that involve hazardous chemicals.

1.10 Safety Showers and Eye Washes

- Safety Showers and Eye Washes will be maintained, inspected, and tested periodically as required by American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) z358.1-2009 *American National Standard for Emergency Eyewash and Shower Equipment*, with the exception of weekly activation of safety showers. Activation of safety showers will be done on a quarterly basis due to issues associated with containment of test water. See LANL Operations and Maintenance Manual, Criterion 407: Emergency Eyewash and Shower Equipment.

1.11 Provisions for Additional Employee Protection

1.11.1 Work with LANL Category 1 Chemicals

- Special handling procedures are necessary to minimize exposures to known human carcinogens, reproductive toxicants, and substances with high acute or high chronic toxicity. Chemicals in these hazard groups are identified in the LANL Cat 1 Chemicals list.
- Handling procedures for these agents will be defined in laboratory or work authorization documents and approved by Deployed Services Environment, Safety, and Health (DSESH) deployed personnel before initiation of work.
- Specific consideration will be given to the following controls, to be used as appropriate for the agent and process: establishment of designated areas; use of containment devices such as laboratory fume hoods or glove boxes; procedures for safe removal of contaminated waste; and decontamination procedures (see 29 CFR 1910.1450, *Labor, Occupational Safety and Health Standards, Occupational Exposure to Hazardous Chemicals in Laboratories* [e] [3] [viii]).

Decontamination is necessary before the affected work area can be released from “designated area” status. The type and level of decontamination should be defined by ISH personnel. After decontamination, the area will no longer be considered a “designated area,” and all warning and control signs will be removed. A wet mop or a vacuum cleaner equipped with a High-Efficiency Particulate Air (HEPA) filter will be used instead of dry sweeping.

1.11.2 Additional Requirements for Carcinogens

A regulated area will be established where a known human or suspected human carcinogen is manufactured, processed, used, repackaged, released, handled, or stored. All materials containing 0.1% (by weight) or more of a listed carcinogen will be clearly labeled to warn of a carcinogen hazard. A list of carcinogens, located in the LANL Cat 1 chemical list can be found on the Chemical Safety Webpage. Less-hazardous, noncarcinogenic chemicals that can be substituted for currently used carcinogens will be substituted when compatible with the work to be accomplished.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 7 of 12)

All areas in which carcinogens are used or stored will meet the following conditions:

- Clearly marked by posting signs warning of a carcinogen hazard. Additional signs and labels are required when OSHA-regulated carcinogens are in use. See P101-19, *Safety Signs, Labels, and Tags*.
- Signs posted prohibiting eating, drinking, gum chewing, smoking, or applying cosmetics or lip balm.
- Ventilation and hood performance that meet minimum requirements before beginning any new operations involving carcinogens. (See P101-16, *Local Exhaust Ventilation and HEPA Filtration Systems*.)
- Evaluation of carcinogen storage and use using the Laboratory Industrial Hygiene and Safety Manual, *Chapter 33, Carcinogens*. Request the Environment, Safety, Health (ESH) Qualified Person perform a re-evaluation of carcinogen hazards when the use of a carcinogen changes in quantity, concentration, frequency, or duration.
- Decontamination procedures for equipment and facilities will be documented in an IWD before new carcinogens are used.
- Notification of ISH and Occupational Medicine (OM) with names of authorized chemical workers working with carcinogens.

1.11.3 Evaluation of Laboratory Operations

- Before laboratory tests or chemical reactions begin, evaluations must be made for hazards that can be encountered or generated during the course of the work.
- Evaluations must include the hazards associated with the properties and the reactivity of the materials used and any intermediate and end products that can be formed, hazards associated with the operation of the equipment at the operating conditions, and hazards associated with the proposed reactions, for example, oxidation and polymerization.
- Where reactions are being performed to synthesize materials, the hazard characteristics of which have not yet been determined by test, precautions must be employed to control the highest possible hazard based on a known hazard of similar material.
- Where use of a new material might present an explosion potential, initial experiments or tests must be conducted in an enclosure that is designed to protect people and property from potential explosion damage.
- Unattended or automatic laboratory operations involving hazardous chemicals must be equipped with regular surveillance for abnormal conditions.

1.12 Personal Protective Equipment (PPE)

- The Laboratory requires that suitable clothing and equipment be used to protect workers and others in Laboratory spaces from hazards in the workplace. PPE is intended to protect the body (including eyes, face, feet, hands, head, hearing, and respiratory system) from hazards capable of causing injury, illness, or impairment of bodily function. No protective material will provide full protection against all hazards. PPE is considered for use as a hazard control strategy only after it has been determined that elimination, substitution and engineered and administrative controls are not feasible, or in the interim while engineered and administrative controls are being designed and implemented. Proper PPE will be identified in the work authorization documentation.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 8 of 12)

- The level of protection and type of PPE selected will match the applicable hazards. See P101-6, *Personal Protective Equipment*.

1.13 Flammable Liquids Storage Cabinets

A flammable liquids storage cabinet is a cabinet that is Underwriters Laboratories listed or Factory Mutual approved for storage of flammable liquids. The Fire Protection-Division Office (FP-DO) should be contacted for questions on what qualifies as a flammable storage cabinet and the chemical limits.

Not more than 60 gallons of Class I and/or Class II liquids, or not more than 120 gallons of Class III liquids may be stored in an individual cabinet. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325ºF when subjected to a standardized 10-minute fire test. Storage cabinets shall be conspicuously labeled, "Flammable - Keep Fire Away."

The bottom, top, door, and sides of metal cabinets shall be at least No. 18 gage sheet metal and double walled with 1½-inch air space. The door shall be provided with a three-point lock, and the door sill shall be raised at least 2 inches above the bottom of the cabinet.

Note: Do not store compressed gases in these cabinets.

1.14 Hydrofluoric Acid (HF)

Hydrofluoric Acid (HF) is a particularly dangerous acid because of its unique ability among acids to penetrate tissue. This ability to penetrate tissue allows HF to cause severe systematic toxicity from even relatively small dermal exposures. For this reason, the following requirements and recommended safe practices apply to work with HF:

Requirements:

- Substitute less hazardous fluoride compounds, where possible, e.g., use aluminum fluoride instead of HF to remove silicates from aqueous solutions.
- An Integrated Work Document (IWD) (see P300, *Integrated Work Management*) is required for work with HF. The IWD must include the first-aid procedure in case of an exposure and what to do in case of a spill.
- As required in P300, the IWD must be readily accessible where the activity is being conducted.
- A Material Safety Data Sheet/Safety Data Sheet (MSDS/SDS) must be available.
- Before working with HF, workers must read the MSDS/SDS, read the IWD, complete training on the first-aid procedure in case of an exposure, and know what to do in case of a spill.
- Workers must be authorized in accordance with the requirements in P300.
- Workers who work with HF must be registered and trained by Occupational Medicine on first-aid procedures associated with HF exposure.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 9 of 12)

- Personal protection by engineered controls, personal protective equipment, or a combination is required for HF use. Controls must be commensurate with the HF hazard represented by a specific use or process involving HF. Your deployed industrial hygienist will assist in the development of and approve personal protective equipment and engineered controls for HF uses and processes through IWD development.
- A calcium gluconate skin exposure mitigation kit must be located in close proximity to the work involving HF. The kit must be replaced with new stock annually. A list of HF first-aid trained personnel must be posted near the kit. Contact Occupational Medicine for mitigation kits and replacement components.
- An HF spill kit must be available with calcium compounds such as calcium carbonate, calcium sulfate, or calcium hydroxide. It is advised that facilities that use or handle HF maintain on hand adequate compatible spill control materials to absorb or contain the volume of the largest volume container of HF commonly within the facility. In facilities with a “no spill cleanup” policy, these materials will supplement that which is immediately available to Hazardous Material (HAZMAT) first responders. Sodium bicarbonate should never be used with an HF spill since it does not bind the fluoride ion and can generate toxic aerosols.

Safe Practices

- Never work alone with concentrated (~6M or greater) HF or large volumes of dilute HF; use a buddy system. It is highly recommended that HF work not be conducted during hours when facilities may have minimum personnel such as nights and weekends even with small volumes and dilute solutions to ensure that there are adequate personnel to render aid in the event of an accident or spill.
- Use an HF-compatible tray or other suitable container while working with HF for containment in case of a spill.
- Store HF in compatible materials (e.g., Teflon, fluorinated ethylene propylene, polyethylene, etc.) containers and keep containers closed.
- Label all nonoriginal containers that contain HF and solutions other than that for immediate use (See Section 1.5).
- Store the stock HF in HF-compatible plastic secondary containment and label the cabinet. Store HF in lower cabinets near the floor. Store HF with other inorganic acids and away from bases, flammables, or oxidizers.
- Wash or wipe gloves with water before removing them, if permissible, by specific laboratory protocols.
- Protect exposed skin and nonresistant or absorbent clothing through:
  - enclosed processes and uses,
  - chemical fume hoods with sash down,
  - gloveboxes with HF-compatible gloves and windows,
  - specially engineered process enclosures, e.g., ventilated cabinets,

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 10 of 12)

Note: Concentrated HF and hydrogen fluoride gas from reactions can etch the glass hood sash on a fume hood and make it hard to see through. If the hood sash becomes fogged and hard to see through because of etching, contact your Facility Operations Director (FOD) representative about installing a polycarbonate sash. In some cases, hood sashes as well as glove box windows may be protected before exposure with a transparent film of Polyvinylidene Fluoride (PVDF, Kynar, Hylar, and Sygef) or other HF-resistant plastic.

- – HF-resistant rubber or plastic apron,
- – HF-resistant plastic arm coverings,
- – HF-resistant gloves and glove combinations,
  - incidental use of dilute acid solutions–double gloves with heavy nitrile exam gloves; re-glove if there is any exposure to the gloves,
  - extended use of concentrated acid–heavy neoprene or butyl gloves worn over nitrile or silver shield gloves,
  - fluorinated polymer gloves for high-concentration and/or high-concentration HF gas exposure,
- – closed toe shoes or chemical resistant boots,
- – long pants and a long-sleeve shirt with a reasonably high-neck (not low-cut).

- Protect the face and eyes through
  - – safety glasses in conjunction with chemical fume hoods with sash down (dilute solutions),
  - – splash goggles in conjunction with a fume hood sash (high-concentration, high-reactivity process), and
  - – face shield in conjunction with splash goggles (open processes, open hood sash).

1.15 Emergency Procedures

Emergency procedures will be in accordance with requirements contained in PD1200, *Emergency Management*.

1.16 Medical Surveillance

Medical surveillance requirements will be in accordance with requirements contained in P102, *Occupational Medicine*.

1.17 Worker Information, Training and Authorization

Chemical workers who work with hazardous chemicals will receive training about those chemicals before they begin work. Chemical workers receive this training through a combination of formal training, reading assignments and job-specific information as specified in the work authorization documentation. Chemical workers who work in areas where hazardous chemicals are used, but who do not work directly with such chemicals, will be made aware of the hazards before they begin work in those areas. Formal training will be conducted and documented in accordance with Laboratory training policy. Chemical workers will be trained on chemicals in use in their workplace at the time of initial assignment and whenever new hazards are introduced. See Section 6.0 of this document.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 11 of 12)

1.18 Use of Non-medical Sharps

- Use the correct tool for the job, i.e., a box cutter to cut boxes.
- Do not shear, clip, or bend needles. Do not recap used disposable hypodermic needles. Do not remove used disposable hypodermic needles from the syringe. If you are using a glass syringe and a non-disposable needle, use extreme caution when recapping the needle, or removing the needle. To recap a non-disposable needle, use either a one-handed “scoop” technique or a mechanical device designed for holding the needle sheath.
- Do not walk with an unprotected sharp.
- Dispose of sharps at the point of use.
- Use needleless systems, or a blunt needle whenever possible.
- Organize your work space so that all materials for the experiment are ready and available before accessing the sharp device. This helps reduce the chance of having to set an exposed needle down on the lab bench in order to retrieve other necessary supplies.
- Be prepared to use the device the moment the sharp is exposed (e.g., when the needle is uncapped, the razor blade removed from its wrapper).
- Make sure you have adequate lighting to perform the task involving the sharp.
- Keep exposed sharps pointed away from yourself and others.
- Never directly hand an exposed sharp to another person. Instead, designate a “sharps passing zone” where exposed sharps are set down prior to being picked up by another person.
- Be accountable for the sharps you use.
- Look around after you complete your work and make sure that all sharps have been disposed of properly.
- Store sharps in a safe manner. Protect the sharp with a cap, cover, or store it in a rigid container.
- Use a dedicated, labeled sharps storage area.

Disposal of Non-medical Sharps:

- Hypodermic needles and contaminated sharps must always be discarded in an approved, rigid, leak-proof sharps container. Do not overfill the container. Do not open sharps containers. Note: sharps containers for personal medical use are available at Occupational Medicine.
- Do not discard loose sharps or sharps containers in the regular trash.
- **Broken glass:** (no regulated chemical or bioagent/biohazard contamination): Carefully sweep up any broken pieces into a dustpan and place them in a hard sided closed container (e.g., cardboard box) labeled “broken glass” with the technical area (TA), building number, room number and generator’s name written on the container. The container can be placed in the regular trash provided the broken glass is not contaminated; coordinate disposal with your WMC.

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Attachment A. LANL Hazard Communication and Chemical Hygiene Plan (Cont.) (Page 12 of 12)

- **Chemical contaminated sharps**: Store in leak-proof, rigid, puncture-resistant containers that are manufactured for the purpose of sharps containment and are taped closed or tightly lidded to preclude loss of contents. Label and manage in accordance with regulatory requirements for the material with which they are contaminated. Contact your WMC for assistance.
- **Uncontaminated (no rad, chemical, or biological) Sharps**: Store in leak-proof, rigid, puncture-resistant containers that are manufactured for the purpose of sharps containment and are taped closed or tightly lidded to preclude loss of contents. Label the container "non-infectious and non-hazardous waste" with the TA, building number, room number and generator's name written on the container. The container can be placed in the regular trash; however, coordinate with your WMC.
- **New Mexico special waste sharps (infectious waste sharps):** Refer to Tool 502 "Infectious Waste" for assistance.

The Chemical Safety Webpage also contains guidance on Working with Sharps and Management of Waste Sharps.

IMPORTANT

If you wish to receive credit for the preceding document you **must** enter the course through U*Train* **not** the Policy Office website.

No: P322-3
Revision: 3

Issued: 09/20/12
Effective Date: 09/20/12

Performance Improvement from Abnormal Events

1.0 PURPOSE

This document defines the process for responding to and notifying others of abnormal events at Los Alamos National Laboratory (LANL or the Laboratory). The abnormal event process is part of the LANL Contractor Assurance System (CAS), and is focused on effectively driving continuous performance improvement from each event.

Events that pose an immediate threat to life or property are subject to additional emergency notification requirements. See Section 3.12.

2.0 AUTHORITY AND APPLICABILITY

2.1 Authority

This document is issued under the authority of the Laboratory Director to direct the management and operation of the Laboratory, as delegated to the Contractor Assurance Officer (CAO), as provided in the Prime Contract. This document derives from the Laboratory Governing Policies, particularly the section on Management Systems, and SD320, *Los Alamos National Laboratory Contractor Assurance System Description Document*.

- Issuing Authority (IA): Contractor Assurance Officer (CAO)
- Responsible Manager (RM): Quality and Performance Assurance–Performance Assurance (QPA-PA) Group Leader
- Responsible Office (RO): Quality and Performance Assurance–Performance Assurance (QPA-PA)

2.2 Applicability

This document applies to all Laboratory workers, including employees of Los Alamos National Security, LLC (LANS), its contractors/subcontractors, students, guests, affiliates, or visitors. This document applies to work-related events on-site, i.e., within the physical boundaries of LANL, and off-site when the workers are (1) in LANL pay status, and (2) working under LANL procedures and requirements. Events involving LANL workers that occur at another Department of Energy (DOE)/National Nuclear Security Administration (NNSA) contractor site and where the work is under that site's procedures and requirements are managed by that contractor's abnormal event process.

Abnormal events include all abnormal conditions, accidents, incidents, or deviations from the planned outcome of a workplace activity that did or could have adversely affect(ed) health or safety of workers, the public, the environment, or the integrity of LANL programs or facilities.

Roles assigned in this document are based on P313, *Roles, Responsibilities, Authorities, and Accountability*. Key roles are filled by the Facility Operations Directors (FODs) and trained investigators from QPA-PA who support the FODs. The term FOD in this document refers to individuals in the Nuclear and High-Hazard Operations Directorate (NHHO), but for events that do not fall within the boundary of an NHHO-managed FOD Unit, refer to individuals outside of NHHO designated to fill the FOD role. Examples of the FOD role served from outside NHHO include:

- Construction/demolition project managers for events within their project,
- Subject matter experts, such as the Environmental Protection (ENV) Division Director, for multi-facility events or events with institutional impact, and
- The Laboratory Deputy Director for all Team Investigations.

Management authority and responsibility for execution of the abnormal event process are assigned to the FODs. FODs may delegate responsibilities and authorities for the abnormal event process to Operations Managers or Duty Officers. Facility-owning Responsible Associate Directors (RADs) establish their involvement in the process through agreements with the FODs. Details of the abnormal event process and procedures are maintained by QPA-PA and found on the Occurrence Reporting webpage.

Processes related to Operational Emergencies (OEs), security incidents, and the Price-Anderson Amendments Act (PAAA)/Worker Safety and Health (WSH) program are beyond the scope of this document. See Section 3.12.

3.0 PROCEDURE DESCRIPTION

The Laboratory has adopted a graded approach for investigating and resolving abnormal events. See Table 1 for a summary of the three-tier graded approach, and Attachment A, *Abnormal Event Process*, for the process flow at each of the three tiers.

Table 1. Graded Approach to Abnormal Events

Event Type	Examples	Who Investigates/Resolves
High-significance Occurrence Reporting and Processing System (ORPS)-reportable events are subject to Team Investigation. See Section 3.11.	▪ Fatality, terminal or disabling injury ▪ Criticality accident or near miss ▪ Radiation exposure exceeding limits for a worker or member of the public	▪ A team appointed by the Deputy Laboratory Director investigates. ▪ The Institutional Management Review Board (IMRB) oversees corrective action.
Low- to moderate-significance ORPS-reportable events, exceeding the ORPS thresholds. See Section 3.2.	▪ Injury requiring hospitalization ▪ Failures of safety-required equipment ▪ Moderate-hazard electrical shock events ▪ Violations of safety requirements	▪ Facility Operations Directors (FODs) with support from full-time, trained investigators in QPA-PA investigate. ▪ Appropriate Management Review Boards (MRBs) oversee corrective action.

Table 1. Graded Approach to Abnormal Events		
Event Type	**Examples**	**Who Investigates/Resolves**
Sub-ORPS events fall below the ORPS thresholds. See Section 3.10.	▪ Minor workplace incidents or near misses ▪ Minor equipment failures ▪ Operational concerns resulting in pause or stop work	▪ Improvement Responsible Managers (IRMs) from the facility or program where the event occurred investigate. ▪ Local MRB oversees corrective action.

3.1 Notify Management of an Abnormal Event

Abnormal events at LANL require immediate management notifications. Workers generally witness first hand or discover evidence of abnormal events, and it is their responsibility to recognize the abnormality, stabilize the situation to the extent possible (e.g., pause or stop work), and initiate the notifications to their chain of facility and line management. These immediate notifications must be concise and factual.

Workers who are involved in any abnormal event or who discover any abnormal condition must:

- Notify their immediate supervisor, or the first immediately available manager in the worker's chain of command; and
- Notify the FOD or FOD designee if required by local procedures or if their immediate supervisor is unavailable.

Supervisors and first line managers, group-level managers, and division-level managers who are notified by a worker or in any way become aware of an abnormal event must:

- Ensure notification of the FOD/designee for all abnormal events;
- Notify the first immediately available manager in their upward chain;

  Note: For minor events, line managers at each level may use their judgment as to the extent of additional, upward, line-management notification; and

- Follow any additional FOD or RAD expectations for additional notifications.

RADs, upon being notified of an abnormal event in their facility should, according to their judgment:

- Consult with the FOD/designee on response to the event;
- Notify their Principal Associate Director (PAD)
- Notify the Deputy Laboratory Director (see Section 3.1.1), and
- Notify affected sponsors or external program managers of the involved facility or project.

The management notifications described above are generally verbal. The responsibility for official written notification of the event is reserved to the FOD in accordance with Section 3.3.

3.2 Categorize the Event

Within two hours of becoming aware of an abnormal event, the FOD or FOD designee must gather key facts, decide whether an abnormal event has in fact occurred, and categorize the event as either ORPS or Sub-ORPS. Categorization follows the reporting criteria of DOE Order 232.2, *Occurrence Reporting and Processing of Operations Information*. Reporting and categorization criteria compliant with DOE requirements are maintained in procedures by QPA-PA found on the Occurrence Reporting webpage. Events falling below the ORPS thresholds are processed as Sub-ORPS. See Section 3.10.

The event categorization establishes the next steps, including:

- External notifications to include NNSA-Los Alamos Site Office (LASO) Facility Representative and possibly DOE Headquarters Operations Center (HQ OC).
- Reporting timelines.
- Rigor applied to the investigation, causal analysis, and corrective action.
- Approvals required for the final report.

Categorization places each ORPS-reportable event into a Significance Category (SC) based on DOE requirements as follows:

- **Significance Category OE**. Operational Emergencies, the highest significance, are categorized exclusively by the LANL Emergency Operations (EO) Division (see Section 3.12)
- **Significance Category 1 (SC1)**: Occurrences that have a significant impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 2 (SC2)**: Occurrences that have a moderate impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 3 (SC3)**: Occurrences that have a minor impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 4 (SC4)**: Occurrences that have some impact on safe facility operations, worker or public safety and health, public/business interests
- **Significance Category R (SCR)**: Occurrences flagged as recurring, based usually on a history of prior similar abnormal events at LANL, and indicating failure of prior corrective actions. Declaration of a Category R event requires concurrence of the Deputy Laboratory Director and chartering of a resource-intensive Team Investigation to evaluate the historic data (see Section 3.11)

If early information is incomplete, the FOD must categorize conservatively (at the higher level being considered) within two hours, then adjust the category at the critique or as more information becomes available.

Events at all levels of severity (ORPS and Sub-ORPS) are subject to additional screening and possibly reporting under the PAAA/WSH program (see Section 3.12).

3.3 Transmit Prompt (E-mail) Event/Incident Notification

As soon as possible after categorization (indicating that an abnormal event has in fact occurred) the FOD or designee sends an e-mail (Event/Incident Notification) to key stakeholders both inside and outside LANL with the best available information about the event. The Event/Incident Notification includes the following:

- Date/Time of Discovery
- Date/Time of Categorization
- Location of the event (TA/Building; RAD)
- Description of the event, including the following information when relevant:
  - Personal injuries
  - Damage to facilities, systems, equipment
  - Impact of event on other activities and operations
  - Protective actions taken or recommended
  - Weather conditions at the scene
  - Level of media or public interest
- Other notifications made
- Whether or not the event is to be included in the Daily/Special Executive Report
  - Title and text for Executive Report
- Whether or not the event is ORPS-reportable
  - ORPS reporting criteria (Group/Subgroup/Criterion)
  - SC

The distribution group for the e-mail includes at a minimum:

- RAD for the event, and any subordinates in the RAD chain according to FOD/RAD agreements
- Associate Director for Nuclear and High-Hazard Operations (ADNHHO)
- QPA-PA investigator assigned to the facility
- QPA-PA staff responsible for the Daily/Special Executive Report
- NNSA Facility Representative for the FOD Unit (required within two hours of the event for all ORPS-reportable events)

  Note: Through agreement with the assigned NNSA Facility Representative, FODs establish facility-specific expectations to include telephone notification if necessary to ensure meeting the two-hour requirement.

- DOE HQ OC (required within two hours of the event for certain ORPS-reportable events, and identified with an asterisk [*] in DOE reporting criteria maintained by QPA-PA and found on the Occurrence Reporting webpage.)

In addition, through agreement with the RAD, FODs establish facility-specific expectations for inclusion of the RAD or certain RAD staff on distribution of Event/Incident Notifications.

3.3.1 Daily or Special Executive Report

The Event/Incident Notification is followed by a Daily Executive Report or Special Executive Report to LANL, LANS, and LASO senior managers. Only ORPS-reportable events and the most significant Sub-ORPS events are included in these Executive Reports. Executive Reports are generated from the FOD's Event/Incident Notification and transmitted by QPA-PA staff on a time scale dependent on event significance as follows:

- For SC2/3/4 ORPS-reportable events (not marked with an asterisk) and any Sub-ORPS event designated by the FOD for inclusion in the Daily Executive Report, QPA-PA develops from the Event/Incident Notification an Operations Event entry into the Daily Executive Report for the next business day.
- For SC1, and SC2*/3*/4*events (requiring notification within two hours of the event to HQ OC by the FOD), QPA-PA develops from the Event/Incident Notification a Special Executive Report to be distributed as soon as possible but no later than two hours after receipt of the FOD's Event/Incident Notification.
- For OE events (requiring notification within15-30 minutes of the event to HQ OC by EO personnel), QPA-PA develops from the EO information as forwarded by the FOD, a Special Executive Report to be distributed as soon as possible but no later than two hours after receipt of the EO e-mail. See Section 3.12 for cautions about exclusive communications authority assigned to EO personnel.

3.4 Critique the Event

The worker-involved meeting to discuss the abnormal event, called the "critique," is the most immediate part of the event investigation and plays a central role in launching an effective partnership between workers, supervisors, and managers to understand the event and improve future performance. Critiques are required for ORPS-reportable events and are optional, at FOD discretion, for Sub-ORPS events (see Section 3.10).

All critiques at the Laboratory must meet three key expectations:

- Critiques must be held as soon as possible after the event. The critique should be held the same day as the event, and for ORPS-reportable events must be held no later than close of the business day following the event. The FOD may, due to extenuating circumstances (e.g., a key involved worker is unavailable), grant an extension of this deadline.
- Attendance in the worker/responder portion of the critique must be held to the minimum necessary and sufficient to understand the event and immediate response. The guideline for minimum attendance is the FOD, QPA-PA investigator, and the involved worker(s). Supervisors and first line managers are encouraged to attend, but to maintain a manageable size and candid environment, managers above group level are encouraged to defer attendance to the critique closeout or post-critique follow-on meetings. The PAAA Office Coordinator, NNSA Facility Representatives, and (for nuclear facilities only) Defense Nuclear Facilities Safety Board Representatives must be invited to all critiques, but attendance is at their discretion and critiques proceed on schedule if they are absent. The size guidelines for LANL critiques apply equally to all events, from minor to the most severe.
- The critique must be an open discussion forum, never a blame placing session. Event investigation is often perceived as a punitive process. Combating this perception begins at the critique, where the FOD and all managers in attendance must take active steps to set and maintain a tone of learning from the experience rather than finding fault with individuals.

Involved workers, responders, managers and subject matter experts called upon to attend the critique must candidly explain the sequence of events leading up to, during, and immediately following the event, participate openly and effectively in the problem-solving discussion, and cooperate fully with the FOD and critique leader.

3.5 Open Event Record in the Performance Feedback and Improvement Tracking System (PFITS) and ORPS

For all abnormal events (ORPS and Sub-ORPS) a record is opened in the PFITS system. For ORPS-reportable events, parallel records are entered into the DOE ORPS system; for Sub-ORPS events, the PFITS record is the sole record of the event. PFITS maintenance beginning at this step is according to the local event-related Performance Feedback and Improvement (PFI) processes, administered with support of Improvement Management Coordinators (IMCs).

Consistency between the ORPS and PFITS systems is ensured by attachment of the written ORPS Notification Report to the PFITS record. The QPA-PA investigator provides assistance to the FOD in generating the Notification Report, or for SC4 events, the Notification/Final Report, in the ORPS system. Notification Reports must be submitted to the ORPS system within the first two business days after the event as follows:

- OE and SC1: no later than Close of Business (COB) the next business day after the day of categorization, not to exceed 80 hours from the date and time of categorization.
- SC2 and SCR: no later than COB the next business day after the day of categorization.
- SC3: no later than COB on the second business day after the day of categorization.
- SC4: Notification/Final (Short Form) Report: no later than COB on the second business day after the day of categorization.

3.6 Investigate

Investigations are required for ORPS-reportable events, and are led by the QPA-PA investigator as the agent of the FOD. Investigations for Sub-ORPS events are required only for more significant events, in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS investigations, if performed, are generally led by the Improvement Responsible Manager (IRM) and IMC according to local event-related PFI processes (see Section 3.10). The most serious events are investigated by a multidisciplinary team (see Section 3.11). All investigations of abnormal events are graded to the risk or significance of the event, and must be performed by individuals trained according to P322-1, *Causal Analysis and Corrective Action Development*.

Subject matter experts are consulted by the lead investigator as deemed necessary to understand the specific event. Human Performance Improvement (HPI) Practitioners should be involved to address human error as it relates to organizational weakness and latent conditions.

3.7 Determine Causal Factors

Causal analysis is required for ORPS events in SCs OE/1/2/3/R, and is optional for SC4. ORPS causal analysis is led by the QPA-PA investigator as agent of the FOD, or by the Team Chair for Team Investigations (see Section 3.11),Causal analysis for Sub-ORPS events is required only for more significant events, in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS causal analysis, if performed, is generally led by the IRM and IMC according to local event-related PFI processes (see Section 3.10). The target for completion of ORPS causal analysis and submittal of a report to the FOD is Day 24 from the event; a similar timeframe is recommended but not required for Team Investigations and Sub-ORPS events (see Attachment A, *Abnormal Event Process*). For all abnormal events the causal analysis must be performed by individuals who are trained and using methods in accordance with P322-1, *Causal Analysis and Corrective Action Development.*

3.8 Develop Corrective Actions

Corrective action development in response to identified causal factors is the same for all abnormal events (events requiring Team Investigations, ORPS-reportable events, and Sub-ORPS events) and follows event-related PFI processes within facilities and programs. PFI processes are described in P322-1, *Causal Analysis and Corrective Action Development* and P322-4, *Laboratory Performance Feedback and Improvement Process*.

Recording and tracking of corrective actions is shared between the DOE ORPS and the LANL PFITS systems. Basic corrective action statements are entered into the ORPS Final Report. Detailed action plans and all active tracking of actions to closure, including changes to the due date or content of the action, are managed using the PFI process and the PFITS system.

ORPS Final Reports (except SC4, for which Notification/Final Reports must be completed in two business days, but corrective actions are optional) must be completed 45 calendar days from categorization of the event. See Attachment A, *Abnormal Event Process*. Extensions beyond 45 days are coordinated between the FOD and QPA-PA investigator, and require FOD concurrence. Team Investigations follow a schedule established in the charter process. See Section 3.11.

Closure of Sub-ORPS events follows guidelines in P322-4, *Laboratory Performance Feedback and Improvement Process.*

3.9 Submit Final Report in PFITS and ORPS

For ORPS-reportable events, FODs approve by signature and own the Final Report. QPA-PA staff assist with filling all required Final Report fields and obtaining Derivative Classifier (DC) review either by QPA-PA staff or the FOD/RAD organizations. Parallel PFITS records for each event comprise the official record of corrective actions and concurrence of all assigned action owners.

NNSA Facility Representatives have approval and change control authority for ORPS Final Reports in significance categories SCR, SC2, SC1, and OE. Coordination of draft reports in these SCs with the Facility Representative and resolution of Facility Representative rejections are shared duties for the FOD and QPA-PA staff. The record of Facility Representative approvals and all change control is kept in PFITS.

Sub-ORPS reports consist of the PFITS record of the event. See Section 3.10.

Team Investigations are entered into the ORPS system but are also published according to the charter. See Section 3.11.

3.10 Sub-ORPS Events

Management notifications (see Section 3.1), categorization by the FOD (see Section 3.2), and prompt e-mail notification (see Section 3.3) apply to both ORPS and Sub-ORPS events. Process steps described in Sections 3.4 through 3.9 are carried out for Sub-ORPS events with the roles shifted from the FOD and QPA-PA investigators to responsible managers and IMCs in the facilities and programs. These differences from ORPS-reportable events are noted in each section above and summarized here as follows:

3.10.1 Criteria for Sub-ORPS Reporting

By definition, Sub-ORPS events include all events reported by the FOD in an Event/Incident Notification that do not meet any ORPS threshold. The Laboratory does not publish de minimis criteria or a “floor” for incidents warranting Event/Incident Notification, i.e., Sub-ORPS reporting. FODs are expected to use operational experience, professional judgment, and common sense in their decisions. Guidance and oversight of the Sub-ORPS reporting decision process are the responsibility and authority of ADNHHO.

3.10.2 Critique of Sub-ORPS Events

Critiques are optional, at the discretion of the FOD, for Sub-ORPS events. If the FOD opts to hold a critique, it should be held soon after the event, but there are no firm timeline requirements. The role of the QPA-PA investigator is replaced by a local IMC who serves as the records manager for the event and enters information about the event and response into PFITS.

3.10.3 Sub-ORPS Investigation, Causal Analysis, and Corrective Action Development

For Sub-ORPS events the requirement and level of rigor for investigation, causal analysis, and corrective action is graded to the severity of the event in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS investigation, causal analysis, and corrective action, if required, are generally led by the IRM and IMC, in accordance with methods and training found in P322-1, *Causal Analysis and Corrective Action Development.* FOD involvement is at local discretion; QPA-PA investigators are generally not involved.

3.10.4 Reporting and Closure of Sub-ORPS Reports

Records and tracking to closure of Sub-ORPS events are strictly within the PFITS system. There are generally no external reporting requirements (see Section 3.12 regarding possible exceptions for PAAA/WSH events) and no timelines for Sub-ORPS events other than guidelines of the PFI process.

Sub-ORPS records are placed in PFITS at the appropriate level of the PFI significance hierarchy based on criteria in P322-4, *Laboratory Performance Feedback and Improvement Process*, and, if applicable, P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*.

3.11 Team Investigations

Team Investigations are performed by a three- to six-member team, and are reserved for the most serious ORPS-reportable events. They are subject to all requirements of Sections 3.1 through 3.9 above, but are sponsored by the affected senior managers and chartered by the Deputy Laboratory Director, who assumes the role of the FOD. The IMRB, chaired by the Deputy Laboratory Director supported by the Institutional Improvement Management Coordinator (IIMC) provides the PFI process regarding acceptance of causal factors and development of corrective actions.

Team Investigations are required for events with final categorizations of OE, SC1 and SCR (see the note below). For SC2/3/4 events, declaration of a Team Investigation is rare but may be recommended to the Deputy Laboratory Director. Proposals and plans for a Team Investigation are developed and submitted to the Deputy Laboratory Director by a sponsor group, comprising at a minimum the following collection of individuals:

- FOD with responsibility for the facility
- RAD with responsibility for the facility
- ADNHHO
- Contractor Assurance Officer

The sponsor group initiates the recommendation to launch a Team Investigation as the significance of the event is understood. Alternatively, the Deputy Laboratory Director may decide to launch a Team Investigation, directing the appropriate sponsor group to assemble and develop the plans. When a Team Investigation is declared, the FOD ensures the event scene is preserved and authority is formally turned over to the Team Chair.

The Team Chair is assigned full-time to the investigation, reports to the Deputy Laboratory Director for the duration of the Team Investigation process, and ensures the Team's report of investigative findings and causal analysis, addressing the scope and within the timeline of the charter memo, is submitted to the Deputy Laboratory Director. QPA-PA supports all aspects of the Team Investigation process and provides a trained investigator to serve full time in support of the process. Team members and consultants assigned in the charter memo are appointed as needed, up to full-time, to the investigation. The Team Chair has authority to enlist additional resources (safety experts, HPI Practitioners, etc.) as deemed necessary. The sponsor group proposes—and the Deputy Laboratory Director approves—resource and cost allocations for the Team's effort.

Guidance on the Team Investigation process, including recommended qualifications of the Chair and team members, charter, infrastructure, investigation, causal analysis, factual accuracy reviews, final report format and content, corrective action development, and approval process are maintained in procedures by QPA-PA found on the Occurrence Reporting webpage.

Note: The requirement for a Team Investigation is based on final ORPS categorization as OE, SC1, or SCR. Events that are declared an OE based on early data but after additional information becomes available are deemed by EO personnel to have at no time actually met the emergency criteria DO NOT automatically require Team Investigation. Such events retain the OE designation in the EO Division records but, like all events, are recategorized by the FOD in the ORPS system as new information becomes available.

3.12 Limitations

Additional event-related processes that apply to certain types of events are beyond the scope of this document, and in some instances preempt requirements of this document.

Operational Emergencies (OEs). Events requiring emergency response (e.g., explosion, fire, hazardous material release) are subject to categorization, notifications, and response under PD1200, *Emergency Management*, and EO-DO-PLAN-100, *Hazardous Materials Program Emergency Plan*, found on the EO webpage, plus any facility-specific emergency management plans and procedures. For the duration of emergency conditions, EO personnel and procedures take precedence and the requirements of this document are preempted.

The first responsibility of all employees in such events is to request immediate assistance by calling 911 and/or Emergency Operations-Emergency Management (EO-EM, 667-6211) as noted in Attachment A, *Abnormal Event Process*. All verbal and written communications regarding a declared OE, both internal and external to LANL and from declaration through termination of the emergency condition, are managed exclusively by EO personnel. After the OE is terminated by EO personnel, the FOD regains control of the event scene and the balance of the abnormal event process proceeds according to this document. Contact EO Division immediately for assistance with severe events that do or might meet OE criteria.

Security Incidents. Incidents of known or potential security concern must be reported to the Security Incident Team (SIT) in the Security Integration Office, in accordance with requirements in P201-3, *Reporting Known and Potential Incidents of Security Concern*. Events strictly of security concern are not subject to the requirements in this document. For events that present components of security concern but also safety or operational issues, the FOD must work with the SIT to ensure requirements of this document and P201-3 are met. Contact the SIT for assistance with the security inquiry program.

Price-Anderson Amendments Act/Worker Safety and Health (PAAA/WSH). Events at all levels of severity (ORPS and Sub-ORPS) are subject to all requirements in this document, but also to additional screening and possibly reporting to the DOE Noncompliance Tracking System (NTS) in accordance with P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*. Contact the local PAAA Point of Contact and/or PAAA Coordinators in the QPA PAAA Program Office for assistance with this program.

4.0 RESPONSIBILITIES

4.1 Deputy Laboratory Director

- Approves and charters Team Investigations.
- Receives and approves final reports from Team Investigations.
- Directs and oversees, through the IMRB, corrective actions from Team Investigations.

4.2 Associate Directors (as Facility-Owning Responsible Associate Directors [RADs])

- Establish agreement with each sponsored FOD regarding roles, responsibilities, and RAD involvement in the abnormal event process, including categorization, critique, corrective action development, and report approval. Written agreements are recommended but not required.
- Coordinate with the FOD on an effective PFI process, including MRB structure and IMC staffing, to support the 45-day closure of ORPS and Sub-ORPS abnormal event reports.

- For events warranting Team Investigation in an owned facility, serve as members of the Sponsor Group.

4.3 Group- and Division-Level Managers

- Ensure the appropriate immediate management notifications of abnormal events, compliant with facility and organizational expectations.
- Cooperate with FOD and QPA-PA investigators in all steps of event critiquing, investigation, causal analysis, and corrective action development.
- Participate in the Sub-ORPS process in accordance with FOD/RAD agreements and local PFI processes.

4.4 Supervisors/First Line Managers

- Ensure timely notification of the FOD (or FOD designee in accordance with local expectations) and first available line manager (group-level or above) for every abnormal event within their work area or span of supervision.
- Cooperate with the FOD and QPA-PA investigator in all steps of event critiquing, investigation, causal analysis, and corrective action development.

4.5 Workers

- Report to supervisors or first line managers any abnormal event or condition, whether within or beyond the bounds of the assigned work area.
- Participate candidly and openly when invited to critiques of abnormal events, or when interviewed as part of the investigation.
- Cooperate with the FOD, FOD staff, and QPA-PA investigator in abnormal event investigations, causal analysis, and corrective action development.

4.6 Associate Director for Nuclear and High Hazard Operations (ADNHHO)

- For all Team Investigations, serves as a member of the Sponsor Group advising the Deputy Laboratory Director and supporting the execution of the investigation.

4.7 Contractor Assurance Officer

- For all Team Investigations, serves as a member of the Sponsor Group advising the Deputy Laboratory Director and supporting the execution of the investigation.

4.8 Facility Operations Directors (FODs) (as defined in Section 2.2)

- Establish agreement with each sponsoring RAD regarding roles, responsibilities, and RAD involvement in the abnormal event process, including categorization, critique, corrective action development, and report approval. Written agreements are recommended but not required.
- Categorize each abnormal event within two hours of discovery.
- As soon as possible after categorization, transmit an Event/Incident Notification describing the event.
- Ensure required notifications to NNSA Facility Representatives and DOE HQ OC are made within required timelines.

- Manage the abnormal event process for the facility, including immediate communications, critique, investigation, causal analysis, and handoff to the local PFI process for corrective action development.
- Review, comment, approve, and assume ownership of every written report destined for the DOE ORPS system.
- Coordinate with the RAD on developing an effective PFI process, including MRB structure and IMC staffing, to support the closure of ORPS and Sub-ORPS abnormal event reports.
- Monitor and drive continuous improvement in meeting the target timeline of developing and providing to QPA-PA corrective actions and other report closure information by Day 45 after categorization of each ORPS-reportable event.
- Resolve conflicts or disputes regarding any aspect of the abnormal event process, and provide field managerial support to the assigned QPA-PA investigator.
- For events warranting Team Investigation, serve as a member of the Sponsor Group.

4.9 Quality and Performance Assurance–Performance Assurance (QPA-PA)

- Deploys trained investigators to support FODs in all aspects of the abnormal event process, from categorization to final report.
- Drafts for FOD review and submits after FOD approval all written reports of abnormal events destined for the DOE ORPS system.
- Maintains official records for each ORPS-reportable event of the complete process from categorization to final report.
- Monitors and drives continuous improvement in meeting the target timeline of delivering draft Update/Final ORPS reports, complete with investigative findings and causal analysis, by Day 24 after categorization of each ORPS-reportable event.
- Provides trained investigators as requested for Deputy Laboratory Director-chartered Team Investigations.
- Serves as a central clearinghouse for the Daily Executive Report and Special Executive Report (for OE and SC1 events).
- Coordinates development and dissemination to Laboratory management and the workforce, lessons learned in response to abnormal events, as needed.

5.0 IMPLEMENTATION

The requirements in this document are effective on the date of issue.

6.0 TRAINING

Personnel assigned responsibilities for the abnormal event process (e.g., Supervisors and First Line Managers in Moderate and High Hazard Operations), must be trained to this document in accordance with P781-1, *Conduct of Training Manual*, utilizing the graded approach found in the Systematic Approach to Training outlined in P781-1.

Specifically, within one year of issuance of this document FODs, Deputy FODs, Operations Managers, Duty Officers, and all other FOD Unit personnel assigned specific ORPS responsibilities must complete the following:

- Course #6206, *Occurrence Investigating and Reporting*

Note: (1) Prior completion of this course satisfies the requirement; refresher completion of Course #6206 is recommended every two years but is not a requirement. (2) If the training is neither grandfathered nor completed within six months of issuance of this document, the individual can continue to fulfill his/her roles and responsibilities with written authorization from the ADNHHO. The written authorization will include a schedule for completing the required training and will expire if training is not completed as scheduled.

Managers and supervisors frequently involved in event investigations or causal analyses should consider additional professional development, including one or more of the following courses:

- Course #53220, *Causal Analyst Training 2011*
- Course #43428, *HPI, Human Performance Improvement, Full Day*
- Course #46713, *HPI Practitioners*
- Course #45090, *HPI Accident Investigation*

7.0 EXCEPTION OR VARIANCE

To obtain an exception or variance to this document, see the following instructions:

- Managers may request an exception or variance from the IA through the RM.
- At the IA's request, the RM will provide a recommendation or supporting information.
- The IA or designee will provide the requester with a written response and copy the RM.

The requesting organization must maintain the official copy of record of the approved correspondence granting the exception or variance.

8.0 DOCUMENTS AND RECORDS

8.1 Office of Record

The Policy Office is the Laboratory Office of Record for this Institutional Document and maintains the administrative record.

QPA-PA is the Laboratory Office of Record for ORPS-reportable events, excluding corrective action records but including categorization records, Team Investigation charters, investigation records, causal analysis records, and all written reports from the initial Event/Incident Notification to the ORPS Final Report.

Responsible FOD and RAD offices are the Laboratory Offices of Record for all records related to Sub-ORPS events, and for records of corrective actions, including change control and closure records, for both Sub-ORPS and ORPS events. PFITS is the record system for all such records. Specific responsibilities are divided between FOD and RAD offices according to local event-related PFI processes.

9.0 DEFINITIONS AND ACRONYMS

9.1 Definitions

See LANL *Definition of Terms*.

Abnormal Event—Abnormal events include all abnormal conditions, accidents, incidents, or deviations from the planned outcome of a workplace activity that did or could have adversely affect(ed) health or safety of workers, the public, the environment, or the integrity of LANL programs or facilities.

Facility Operations Director (FOD) Unit—A collection of buildings, structures, and work areas under a single FOD's span of responsibility. Abnormal events are assigned to FOD Units based on the physical location of the event.

Facility Operations Director (FOD)/Responsible Associate Director (RAD)—A general term to describe the joint management team of a FOD Unit and the RAD for a facility.

9.2 Acronyms

See LANL *Acronym Master List*.

ADNHHO	Associate Director for Nuclear and High-Hazard Operations
CAO	Contractor Assurance Officer
CAS	Contractor Assurance System
COB	Close of Business
DC	Derivative Classifier
DOE	Department of Energy
ENV	Environmental Protection
EO	Emergency Operations
EO-EM	Emergency Operations-Emergency Management
ESH&Q	Environment, Safety, Health, and Quality
FOD	Facility Operations Director
HPI	Human Performance Improvement
HQ	Headquarters
IA	Issuing Authority
IIMC	Institutional Improvement Management Coordinator
IMC	Improvement Management Coordinator
IMRB	Institutional Management Review Board
IRM	Improvement Responsible Manager
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LASO	Los Alamos Site Office
MRB	Management Review Board
NHHO	Nuclear and High-Hazard Operations
NNSA	National Nuclear Security Administration
NTS	Noncompliance Tracking System
OC	Operations Center
OE	Operational Emergency
ORPS	Occurrence Reporting and Processing System
PAAA	Price-Anderson Amendments Act
PAD	Principal Associate Director
PFI	Performance Feedback and Improvement
PFITS	Performance Feedback and Improvement Tracking System

QPA-PA	Quality and Performance Assurance–Performance Assurance
RAD	Responsible Associate Director
RM	Responsible Manager
RO	Responsible Office
SC	Significance Category
SIT	Security Incident Team
WSH	Worker Safety and Health

10.0 HISTORY

Revision History		
09/20/06	ISD 322-3.0	Initial Issue, ISD 322-3.0, *Manual for Communicating, Investigating, and Reporting Abnormal Events.*
09/25/06	ISD 322-3.1	Administrative Change. IP300-SD5 replaced and rescinded by IP320.0.
10/15/08	ISD 322-3.2	The following Quick Changes (minor non substantive) were made: Global change to document: QA-OA to ESH-IO. Page 5, Overview, paragraph 3 , add: 1. sentence: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4, *Laboratory Performance Feedback and Improvement Process*. 2. add ESH Integration Office (ESH-IO) to sentence Events that meet a DOE defined reporting criterion are reported and investigated by trained and qualified… Page 5, Overview, paragraph 4, changed to: The Associate Director for Environment, Safety, Health, and Quality is the Issuing Authority (IA) for this document. The ESH-IO Office Manager is the Responsible Manager (RM) and the Occurrence Reporting Team (OR) is the Responsible Office (RO). Page 8, Abnormal Event/Condition Process Outline, change bullet 14 and add bullet 15: ▪ 14) All ORPS corrective actions are entered into LIMTS and tracked as described in P322-4. ▪ 15) ORPS events are trended and analyzed for repetitive events on a quarterly basis. Page 13, bullets 6 and 7: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4. Page 12, Note: Delete note. Page 13, Categorization process, item 2, second bullet, change to: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4. Page 14, Preparing for a Critique, item 2, second bullet, add: must be notified. Page 16, item 2, add: and consider extent of condition. Page 17, bullet 4, change to: Events are reported in LIMTS system as described in P322-4.

Revision History		
12/11/08	P322-3, Rev. 0	Renumbered document, ISD 322-3, *Manual for Communicating, Investigating, and Reporting Abnormal Events*.
04/15/09	P322-3, Rev. 1	Quick Change Replace previous IA with newly identified AD. Clarification of existing requirements as documented in detailed individual procedures (pages 5, 7, 10, 12, 15, 17, 18). Revision of flowchart to reflect adherence to P322-4.
07/27/11	P322-3, Rev. 2	Major Revision Change title from "Manual for Communicating, Investigating, and Reporting Abnormal Events," to "Performance Improvement from Abnormal Events." Revise process to achieve consistency with Performance Feedback and Improvement Process changes. Revise organizational roles due to move of ORPS Team from Environment, Safety, Health, and Quality (ESH&Q) to CAO-PF. Change IA, RO, and RM to match organizational restructure.
09/20/12	P322-3, Rev. 3	Changed CAO-PF to Quality and Performance Assurance-Performance Assurance (QPA-PA) throughout document due to reorganization. Clarified language in Section 2.2. Updated links, titles, and acronyms.

11.0 REFERENCES

Prime Contract:

- DOE O 232.2, *Occurrence Reporting and Processing of Operations Information*

11.1 Other References

- SD320, *Los Alamos National Laboratory Contractor Assurance System Description Document*
- P313, *Roles, Responsibilities, Authorities, and Accountability*
- Occurrence Reporting webpage
- P322-4, *Laboratory Performance Feedback and Improvement Process*
- P322-1, *Causal Analysis and Corrective Action Development*
- P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*
- PD1200, *Emergency Management*
- EO-DO-PLAN-100, *Hazardous Materials Program Emergency Plan*, found on the EO webpage
- P201-3, *Reporting Known and Potential Incidents of Security Concern*
- P781-1, *Conduct of Training Manual*

12.0 FORMS

There are no forms associated with this document.

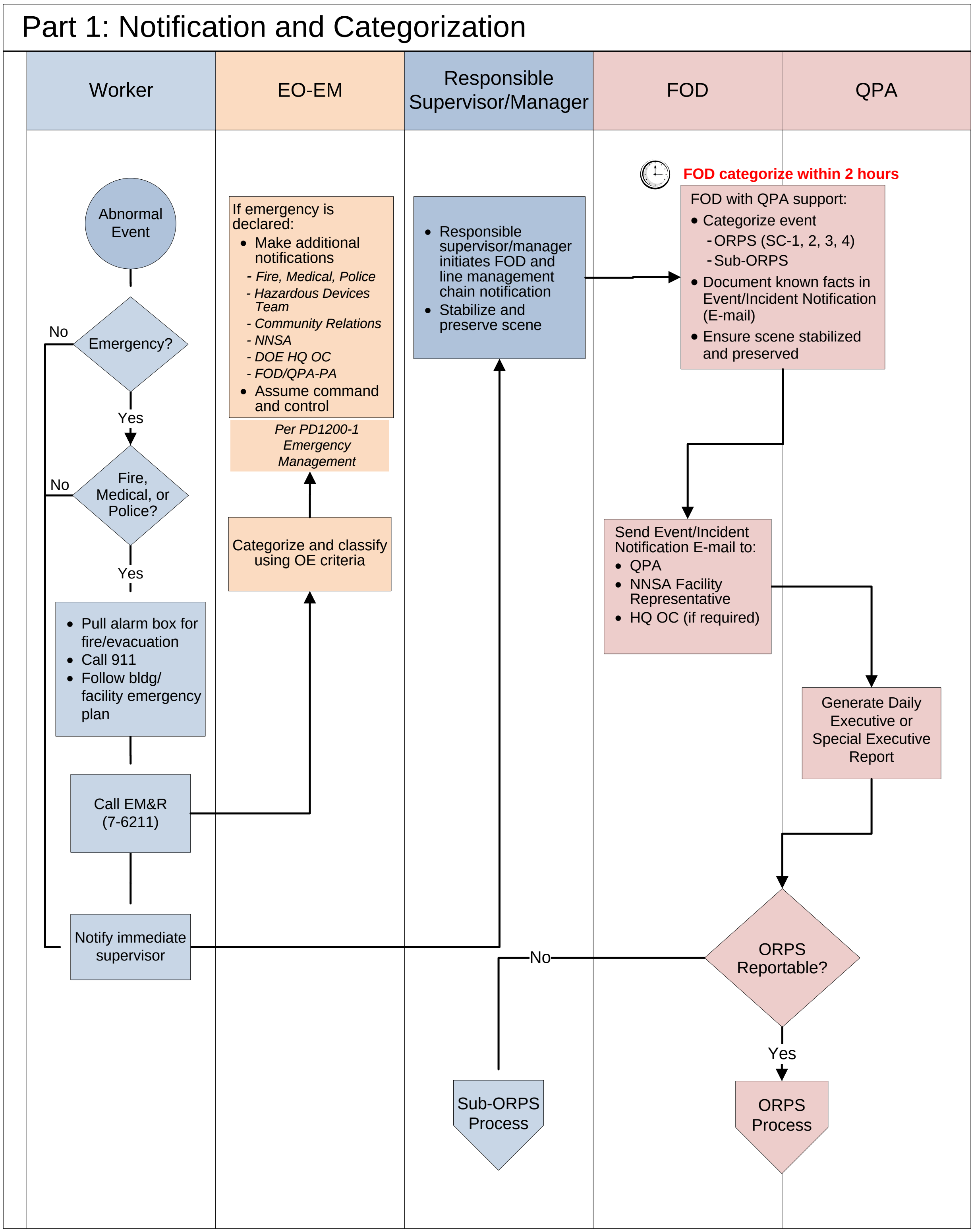
13.0 ATTACHMENTS

Attachment A. *Abnormal Event Process*

14.0 CONTACT

Quality and Performance Assurance–Performance Assurance (QPA-PA)
Telephone: (505) 606-2145

No: P322-3 Performance Improvement from Abnormal Events
Attachment A. Abnormal Event Process (Page 1 of 4)



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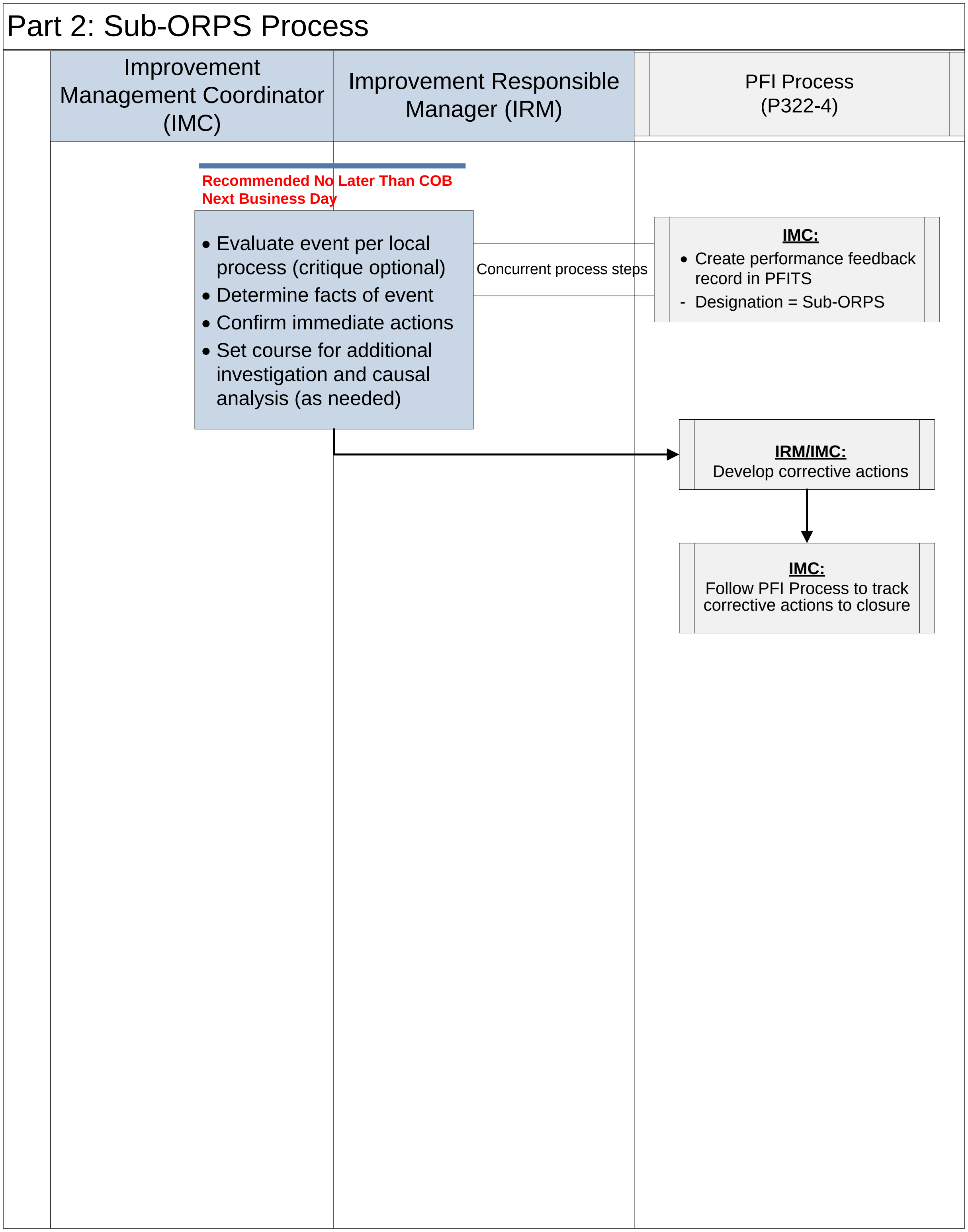
Attachment A. Abnormal Event Process (Cont.) (Page 2 of 4)



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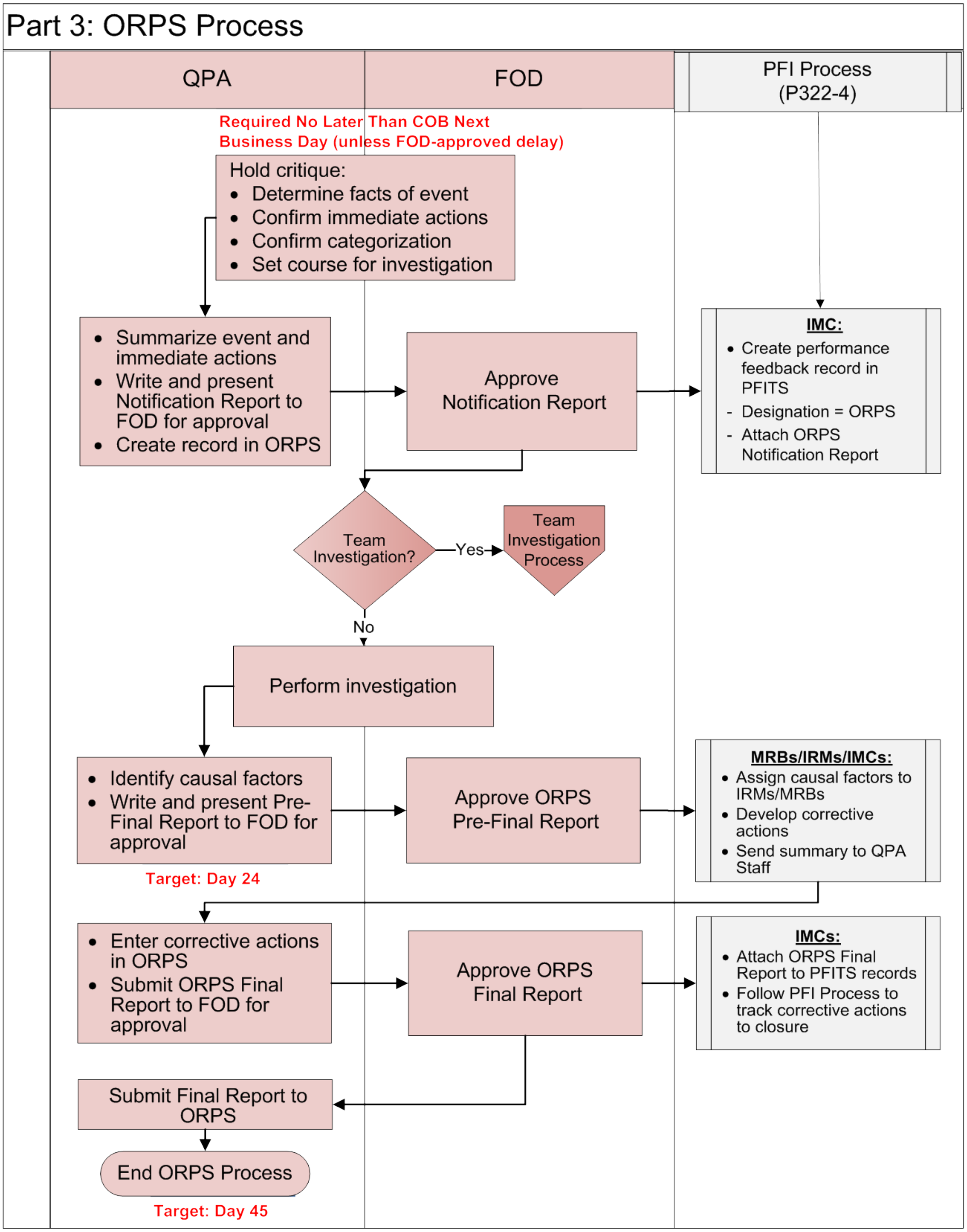
Attachment A. Abnormal Event Process (Cont.) (Page 3 of 4)



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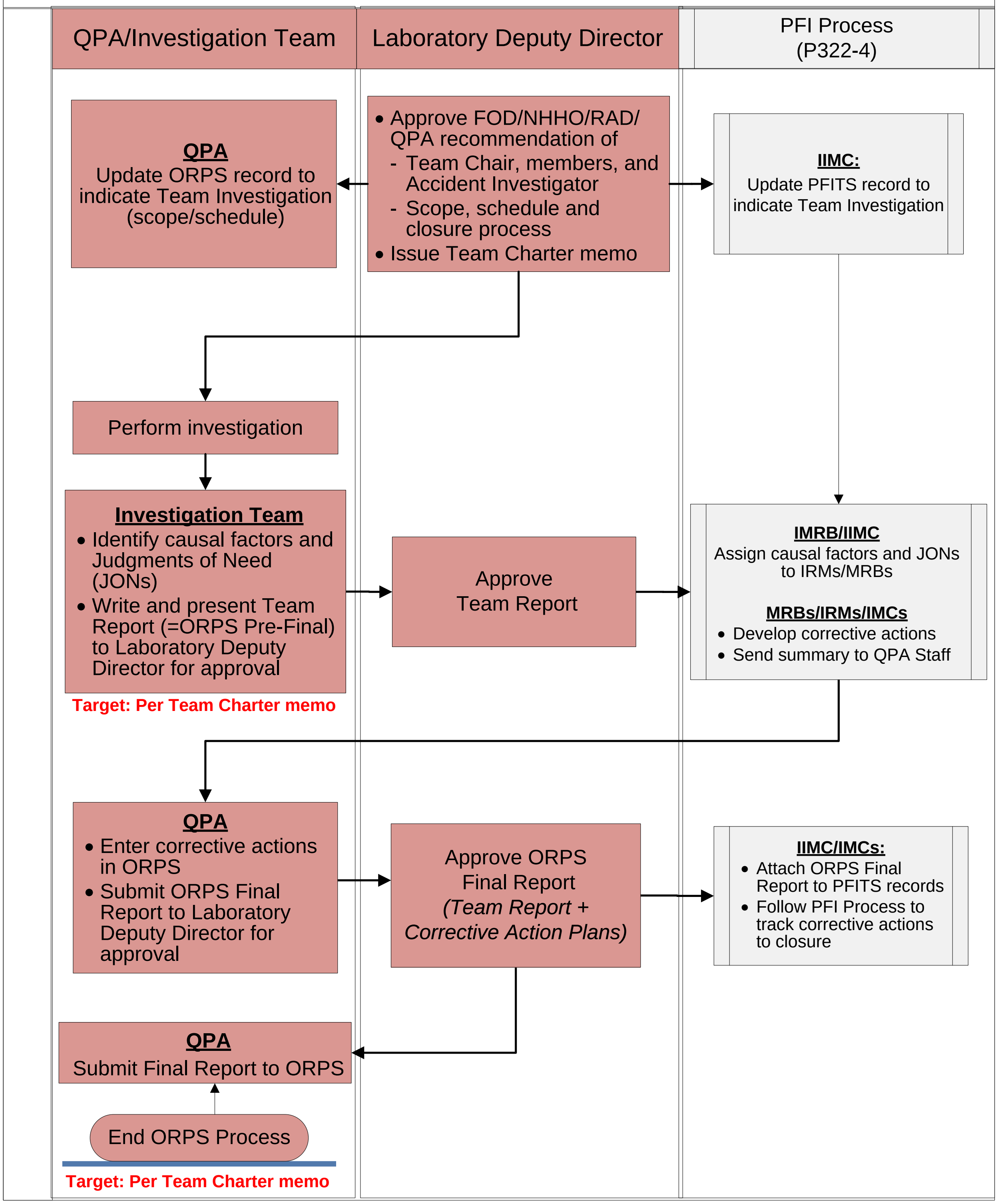
Attachment A. Abnormal Event Process (Cont.) (Page 4 of 4)

Part 4: Team Investigation Process



IMPORTANT

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PRO-0493-STO-HAZMAT, R1

STO Spill Response Procedure

Effective Date: 12/08/14

Supersedes: PRO-0493-STO-HAZMAT, R0

Next Review Date: 12/08/16

Hazard Class: ☐ Low ☒ Moderate ☐ High/Complex

Usage Mode: ☒ Reference ☐ UET UET Sections: ____

Status: ☐ New ☒ Major revision ☐ Minor revision ☐ Reviewed, no change

Reviewers

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Approval Signatures

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Classification Review

☒ Unclassified ☐ UCNI ☐ Classified

Name	Z#	Signature	Date
Ed Pitchkolan	199035	[signature]	10/8/14

Revision History

Document Number and Revision	Effective Date	Action
PRO-0493-HAZMAT, R0	2/28/10	Original issue
Description: Original Issue		
PRO-0493-HAZMAT, R0	1/14/13	Periodic Review, No Revision
Description: Periodic Review, No Revision		
PRO-0493-HAZMAT, R1	12/08/14	Major
Description: Editorial changes throughout document, updated references and organizations.		

Table of Contents

1.0 PURPOSE

This procedure provides emergency actions and a formal approach to responding to spills of hazardous materials including:

- Spill prevention,
- Spill response,
- Staging response materials; and,
- Response preparations

2.0 SCOPE

This procedure applies to Science and Technology Operations (STO) personnel involved in responding to spills within STO managed facilities with hazardous materials (including direct, deployed and subcontractor employees).

3.0 IMPLEMENTATION

PRO-0493-STO-HAZMAT

4.0 INTRODUCTION

If handled properly, a spill may be nothing more than a nuisance. If handled improperly, a spill can seriously disrupt activities and the STO mission. At worst, a spill can cause personnel injury/illness, environmental damage, and/or property damage.

To prepare for spill, you should: (1) learn about the hazards of the spills in your workplace, (2) understand processes/controls for spill prevention and containment, (3) understand the responses to spills and response procedures for higher probability spills, (4) make sure that you have the personnel equipment and training necessary to follow those procedures, and (5) practice spill response.

In most cases, incidental and simple spills involve small quantities of materials and, if precautions are taken, present minimal hazards. Local workers are usually the most appropriate people to clean up simple spills because them are more likely than others to be familiar with the spilled material's hazardous characteristics; can respond quickly; know about other potential hazards or complicating factors in their work area; should be familiar with the proper cleanup techniques for a particular spill; and are authorized by their management to clean up simple spills through written procedures or IWDs.

Complex spills require Emergency Operations (EO) assistance because of the spill's size or its unusual hazards. Trained hazardous material spill responders have learned that it is much better to be overly cautious in responding to a spill than to risk lives for something that "shouldn't be too dangerous." Do not downplay the seriousness of large or complex spills.

The priority of actions taken during spill response shall be (1) protect personnel, (2) protect the environment, and (3) protect facility and programmatic equipment.

5.0 DEFINITIONS/ACRONYMS

5.1 Incidental Spill:

A minor spill incidental to routine work where no special spill response is needed. (For example: minor drips from a pipette onto an absorbent, drips from a chemical container cap, or minor spills of analytical chemical, sample, or other materials. Also, a minor spill that is entirely confined within a working fume hood, glove box, dry box, secondary containment, or other containment and that does not create exposure beyond the containment). Incidental spills are limited to the following conditions:

- The spill is minor and incidental to routine work and anticipated to happen; and,
- The hazards and controls created by the spill are bounded by the IWD or other procedure; and,
- The current exposure assessment is adequate to address cleanup; and,
- The worker is authorized to cleanup the incidental spill by their management.

5.2 Simple Spill:

A spill that is not a part of routine work, but may be cleaned up by local workers. Simple spills do not require Emergency Operations (EO) assistance to manage. Attributes of a simple spill include the following:

- The hazards and controls created by the spill are bounded by the IWD or other approved procedure.
- The workers(s) are authorized to cleanup the simple spill by their management.
- The worker(s) are trained in spill response.
- The current exposure assessment is adequate to address spill cleanup.
- Respiratory protection is not required to clean up the spill.
- Workers have appropriate PPE and spill cleanup materials.
- Does not endanger non-involved workers.
- Does not endanger the environment or facility.
- Lacks potential to become an emergency.
- There are no electrical safety concerns.

5.3 Complex Spill:

A spill that is not a part of routine work and requires EO response (SEO-1 – Emergency Response - HAZMAT) for cleanup. Attributes of a complex spill include any of the following:

- The hazards and controls are NOT identified in the IWD, or exceed those in the IWD or other approved procedure.
- The worker is NOT authorized to cleanup the spill by their management.
- The current exposure assessment is NOT adequate to address spill cleanup.
- Workers do NOT have appropriate personal protective equipment (PPE) and spill clean-up.
- Respiratory protection is required to cleanup the spill.
- Does endanger non-involved workers.
- Does endanger the environment or facility.

- The spill has the potential to become an emergency, personnel are injured, fire is present, or there is a gas leak (CALL 911).
- There are electrical safety concerns.
- In a confined space, or releases hazardous vapors in an area that is unventilated.
- There is need for building evacuation or increased traffic control or increased building security
- Incompatible or reactive materials are spilled.
- Flammable materials in quantities that are not approved to be cleaned up by management are spilled.
- Carcinogenic or highly toxic materials are spilled.
- Lastly, a simple spill where the workers are not comfortable performing spill cleanup may be managed as complex.

5.4 Involved Worker:

Workers directly involved in the spill area, causing the spill, or in the immediate vicinity.

5.5 Immediate Action:

Emergency action that should be accomplished promptly and before any follow-up actions. When multiple emergency actions are required, they may be performed simultaneously unless there is a specific order of actions required.

5.6 Spill Kit:

A kit that is an accumulation of supplies useful in responding to spills. Supplies that may be in the spill kit include barrier devices, absorbents, PPE, bags and are customized to the activity or facility that may cause a spill. Spill kits are maintained and inventoried on a regular basis. Details for Spill Kits are included in Appendix C.

5.7 Acronyms

EO – Emergency Operations

ENV - Environmental

ESH – Environment, Safety, Health and Quality

FOD – Facility Operations Director

IHS – Industrial Hygiene and Safety

IWD – Integrated Work Document

HAZMAT – Security and Emergency Operations – Emergency Response (SEO-1)

OM – Operations Manager

PIC – Person in Charge

PPE – Personal Protective Equipment

RLM – Responsible Line Manager

RCT – Radiological Control Technician

STO- Science and Technology Operations

WMC – Waste Management Coordinator

6.0 RESPONSIBILITIES

Refer to section 8 for detailed responsibilities for spill response. Additionally, the following responsibilities are developed in this document.

6.1 ESH (deployed IHS, RCT, ENV, WMC)

Prepare and maintain facility spill kits as directed by the ESH/WS Manager and the Operations Manager.

6.2 Facility Operations Director (FOD)

Responsible to:

- Establish and maintain the safety, security, and environmental compliance envelope.
- Approve and issue procedures that accurately establish administrative, technical, and response guidance for the overall safe, secure, and environmentally compliant operation of the assigned facilities.
- Request and ensure that FOD personnel (operations, maintenance, facility engineering, ES&H, waste management, technical support, and administrative personnel) have appropriate training and qualifications to support facility and programmatic activities.
- In emergencies, ensure that personnel know who to call and what to do. For medical emergencies, life-threatening situations such as a fire, explosion, bomb threat, or terrorist attack call 911. Callers using mobile phones should be prepared to state the location of the emergency as precisely as possible. For all other situations requiring immediate response or dispatch, to include abnormal/unusual events, unattended packages, spills, leaks, and contamination contact Emergency Management by calling the Emergency Operations Support Center (EOSC) at 667-6211.
- Assist the EO-EM IC or EM at the scene of an emergency, and provide support to the EOC during activation.

6.3 Operations Manager (OM)

Responsible to oversee development and placement of spill kits adequate to respond to spills for facility or maintenance, activities that are a concern for the facility.

6.4 Person-in-charge (PIC)

Responsible to include spill prevention and response controls and processes in developing IWDs or other work control documents, and as necessary for higher probability or risk spill to document them.

Responsible to create and maintain spill kits adequate to respond to spills for activities where they are the PIC.

7.0 GENERAL REQUIREMENTS FOR A SPILL RESPONSE

7.1 Spill Prevention Processes/Controls

Spills can occur during a material's storage, transportation, or transfer, as well as in a laboratory. Spill prevention minimizes the likelihood of a spill. Details on spill prevention programs are in Appendix A.

7.2 Know Your Hazards and know Spill Response Plans as needed (Refer to Appendix B for more details)

PICs take into consideration the "what-if" planning for spill response and potential problems. Include spill prevention and response controls and processes in developing IWDs or other work control documents. Document controls for materials with unique specific hazards (e.g. Lead, Mercury, Plutonium) and spills of higher probability or risk.

Organizations should ensure that bounding conditions for simple versus complex spills are clearly identified and communicated so that employees have a clear understanding of when a spill is no longer simple and outside assistance is required.

Where non-routine and/or specific procedures for spill response are a important control, they should be included in the IWD or other local document that covers a group of activities, a facility, a work group, etc.

7.3 Make Materials and Equipment Available

PICs shall prepare and maintain spill kits appropriate for the activity. Operations Managers shall prepare and maintain spill kits appropriate for facility operations and to address major potential spill hazards in the facility. Details on Spill Kits are in Appendix C.

7.4 Routinely Practice Spill Response

Facility and Programs should practice spill response to verify procedures and IWD effectiveness. Simple training that includes tabletop discussions can be used to introduce and verify personnel knowledge about specific spill responses.

8.0 Spill Response Emergency Instructions

Note: This section applies to simple and complex spills. Incidental Spills (see definitions) are not required to follow this section.

Action	**Responsible Person**
Warn Others (This is an immediate action an applies to both simple and complex spills.) **WARNING** **IF THERE IS A FIRE, INJURY, GAS LEAK OR OTHER EMERGENCY – CALL 911 FIRST. THESE CIRCUMSTANCES DEFINE SUCH SITUATIONS AS A COMPLEX SPILL AND REQUIRE EO RESPONSE. IF THERE ARE INJURED PERSONNEL, THE PRIORITY IS TO FIRST CARE FOR THE INJURED.** The **Involved Workers** must immediately communicate the spill to the workers in the immediate vicinity. The **Involved Workers** shall notify, or have a co-worker immediately notify the First Line Manager (RLM) and the Operations Manager. The **RLM** shall notify their Line Management. The Operations Manager shall notify the FOD, or designee. Note: For off-hours response the Duty Operations Manager shall be contacted at pager # 664-4444.	Involved Workers RLM Operations Manager
Stop the Spill – If it is safe to do so (This is an immediate action and applies to both simple and complex spills.) **WARNING** **INVOLVED EMPLOYEES SHOULD ONLY ATTEMPT TO STOP THE SPILL IF IT IS SAFE TO DO SO AND SHOULD NOT LINGER IN THE SPILL AREA TO PERFORM THIS ACTION. IF IN DOUBT, EXIT THE AREA AND SEEK ASSISTANCE.** **Involved Workers** should stop the work that caused the spill and if possible stop the spill. This may be performed simultaneously with warning others. I some cases simple actions such as righting an overturned container, shutting a valve, or applying approved and ready-to-use absorbents will reduce or stop the spill.	Involved Workers

Once Involved Workers have exited the area, they should not reenter the spill area to further stop a spill. Re-entry will be controlled to ensure personnel exposures are prevented.	
Isolate the area This is an immediate action and applies to both simple and complex spills. The **Involved Workers and Responders** shall isolate the area to prevent non-involved workers from being exposed to the spill area. For a simple spill this may be as simple as closing a door. For larger spills or a complex spill this may require use of barricade material and warning signs. Note: Barricade and other spill response materials are in the spill kit.	Involved Workers and Non-Involved Workers responding to assist
Reduce Exposure to Personnel: This is an immediate action and applies to both simple and complex spills. **Involved Workers that may have been exposed to spilled materials** or their by-products shall be taken to Occupational Medicine by their RLM. All **Non-involved Workers** and personnel in the adjacent areas shall move well away from the area to minimize potential exposure risks. For a small simple spill this may require minimal actions. For example, a small simple spill may be easily isolated to a room or section of a facility. **EO and Operations Manager**, with advice from ESH, has the key responsibility to ensure that all employees are moved to a safe area to prevent inadvertent exposure to airborne exposures, or other exposures from the spill or its vapors. In some cases, spills may require evacuation of all or part of a facility. The **Operations Manager** should evaluate the ventilation systems; drain systems, etc. to determine if any system alignment changes need to be made to reduce the spread of the spill and airborne concerns or other hazards from the spill. This could include securing unfiltered ventilation, redirecting a ventilation duct that is blowing on the spill area, securing a fan, increasing exhaust filtered ventilation flow from a spill area, isolating a drain system, and protecting the environment. The Operations Manager should consult with involved workers, ESH, ENG as needed. Facility **ESH** staff shall respond to all simple and complex spills as directed by the Operation Manager and/or EO. **IHS and RCT** staff (for complex spill EO) shall verify that the spill has not spread by appropriate observations and measurements. Particular attention should be on verifying that non-involved workers are not exposed to hazards resulting from the spill, such as liquids, vapors, gases, fumes, etc.	Exposed Workers, RLM All Workers EO, Operations Manager, IHS, Engineering IHS, RCT, ENV, WMC IHS, RCT, EO

Action	**Responsible Person**
Determine if the spill is simple or complex This is not an immediate action – in most cases. **If there is any doubt on the spill being potentially complex, or if workers are not comfortable performing spill cleanup – conservatively assume the spill is complex and seek assistance from EO.** While spill response should be timely, there are few situations when one must unduly rush to classify and cleanup a spill. Situations where speed is of the essence should have local IWDs and procedures to address that circumstance. The pace of response should be in a controlled fashion with emphasis on good decision-making. Involved Workers shall classify the spill. For most spills, the decision to classify the spill as simple vs. complex is clear. There are two types of spills. • Simple spills, which the authorized worker with an approved IWD or procedure can clean up (refer to definitions). • Complex spills, which require EO assistance (refer to definitions). When the classification decision is more difficult, **Involved Workers** should methodically evaluate the spill, consult their PIC and RLM, consult procedures, consult MSDS sheets, consult with ESH, and Operations as needed.	Involved Workers
Cleanup a Complex Spill **Involved Workers** contact HAZMAT for assistance at 667-6211.	Involved Workers
Involved Workers shall obtain the most up-to-date inventory of chemicals in the spill area and provide that to Emergency Responders	Involved Workers
Operations Manager meet with HAZMAT response and provide assistance as requested.	Operations Manager
IHS, RCT, WMC, ENV rallies at the Emergency Response staging area to provide advice and support assistance to HAZMAT	Operations Manager, ESH, WMC

Action	Responsible Person
Cleanup A Simple Spill **CAUTION 1** **UNLESS OTHERWISE APPROVED BY THE RLM, THE TWO-PERSON RULE APPLIES TO CLEANUP OF SIMPLE SPILLS. (NOT TO INCIDENTAL SPILLS.)** **CAUTION 2** **IF THE SPILL PRESENTS HAZARDS THAT ARE BEYOND THE LOCAL IWD OR APPROVD PROCEDURE, THEN THE SPILL IS COMPLEX.**	
Involved Workers follow the guidelines in the IWD or local procedure for cleaning up a simple spill.	Involved Workers
IHS and RCT staff shall monitor conditions in the spill area to measure the level of exposure that personnel are exposed to. Note: A general discussion of spill response is located in Appendix A.	RLM, Operations Manager, and ESH
Document the Process: The **Operations Manager** will document the spill cleanup process in the Operations Manager's logbook, if applicable	Operations Manager
Post Spill Cleanup and Follow-up Some spills leave residual conditions in the area that require further decontamination and/or ESH clearance to release the area to routine operations. **Operations Manager** will involve Waste Management personnel to manage spill cleanup materials.	Operations Manager, ESH, WMC
IHS and RCT staff may be asked to reconstruct exposures to workers in the spill area and should seek assistance from their Supervisors as needed.	IHS, RCT

Action	Responsible Person
Return to Normal Operations and Follow-up **CAUTION** **ONLY THE OPERATIONS MANAGER OR EO HAS THE AUTHORITY TO RELEASE A SPILL AREA FOR NORMAL OPERATIONS TO RESUME. (This does not apply to incidental spills.)**	
Operations Manager with advice from Involved Workers, the PIC, ESH, and WMC will determine when to transition from cleanup operations to normal operations. Normally, a fact-finding or critique may be needed following a spill. In some cases, normal operations should not be allowed until that is complete.	Operations Manager

9.0 SPILL KIT INSTRUCTIONS

- PICs shall prepare and maintain spill kits appropriate for the activity. Operations Managers shall oversee preparation and maintenance of spill its appropriate for the facility and to address major potential spill hazards in the facility. ESH/WS staff will prepare and maintain spill kits for facilities as directed by the ESH Manager and Operations Manager. For example, RP staff for radiological facilities should prepare spill kits appropriate for spill response to radiological materials.

- Spill Kit Owners shall regularly inspect all kits and equipment to ensure that they will function properly when needed.

- A tamper-indicating device may be used to ensure that the spill kit is always ready to use.

- Recommendations for Spill Kits are in Appendix C.

10.0 REFERENCES

Guide for Hazardous Material Spill Response Planning in Laboratories, ACS, 1995
P 101-13, Electrical Safety Program
P 101-14, Chemical Management
P 101-32, Worker Exposure Assessments
P 300, Integrated Work Management
P 313, Roles, Responsibilities, Authorities, and Accountability
P 322-4, Laboratory Performance Feedback and Improvement Process
P 405, National Environmental Policy Act (NEPA), Cultural Resources, and Biological Resources (NCB) Reviews
P 1201-4, LANL Emergency Procedures and Protective Actions

11.0 APPENDICES

Appendix A, Spill Prevention
Appendix B, Spill Response Guidelines
Appendix C, Spill Kits

Appendix A, Spill Prevention Methods

Page 1 of 2

Acknowledgement:

Portions of the following are excerpted from the American Chemical Society's pamphlet "Guide for Chemical Spill Response Planning in Laboratories. Prepared by the American Chemical Society's CEI/CCS Task Force on Laboratory Waste Management American Chemical Society, Washington, DC 1995

Common examples of spill causing incidents and associated prevention techniques are shown in Table 1. Laboratory spills can occur during a chemical's storage, transportation, or transfer, as well as in the actual experiment. A spill prevention program for storage areas should include the following:

- Sturdy shelves and properly designed storage areas to minimize breakage and tipping;
- Secondary containment for stored chemicals and materials;
- Containers stored by hazard class;
- Larger containers stored closer to the floor;
- Containers stored on shelves sufficiently away from the shelf edge to minimize the danger of falling;
- Storage shelves with lips to reduce the danger of falling;
- Regular inspection of the integrity of containers; and
- Seismic security in earthquake-prone areas

To minimize spills during transport, a laboratory should integrate the following:

- carts, where appropriate,
- safety containers,
- rubberized buckets,
- straps to secure containers, and
- properly trained and thoughtful workers.

For the transfer of liquids from one container to another, the risk of spills can be reduced by

- paying careful attention to the size of containers to avoid overfilling;
- using pumps or other mechanical devices rather than simply pouring directly into a container;
- providing spill containment to capture any leaks; and
- bonding and grounding containers when flammable liquids are involved.

In addition to chemical spills, water spills can be caused by loose connections or breaks in lines to water condensers or cooling systems. Such spills can cause damage and inconvenience, even if they do not present environmental or health risks. Appropriate planning, including use of security clamps or devices to prevent loosening of connections or automatic shut-off devices, can reduce the likelihood of flood damage. Occasionally, a laboratory may be affected by a leaking roof or a flood elsewhere in a building. Planning to prevent damage from incidents should include the protection of instruments that might be harmed by water. Similarly, storing chemicals and supplies so that they will not be touched by leaking water will minimize damage and inconvenience.

Appendix A, Spill Prevention Methods (continued)

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While considerable attention is given to potential spills or leaks of liquids, laboratories using gases should also develop spill prevention plans for these materials. Such plans should consider safety concerns related to securing tanks and other gas containers. Additionally, frequent checks of valves and tubing can be useful in spill and leak prevention. A laboratory should take care to prevent gas from escaping down a drain or up a fume hood.

Finally, pay attention to physical details in the laboratory, such as

- reducing clutter and unnecessary materials.
- Eliminating tripping hazards and other obstructions, and
- Having all needed equipment readily available before starting work.

In addition to prevention or spills, having an up-to-date list of chemicals in the laboratory is important to those responding to a spill or emergency responders.

Table 1: Spill Prevention:

Potential Cause of Spill	**Prevention Technique**
Container, such as a flask or beaker, tips over	Secure containers and equipment to minimize the possibility of tipping.
Container dropping	Keep containers and experimental equipment as low as possible.
Breaking a container or a piece of experimental apparatus	Protect containers from breakage by keeping other items from falling on them.
A runaway reaction	Plan experimental reactions to anticipate and to provide controls for undesired outcomes such as overheating.
Releases during transfer of materials from one container to another	Pay attention to what you are doing. Provide secondary containment in the event of spills.
Holes and other leaks in transfer equipment such as pipes, hose, or valves	Check for holes or leaks before use.
Placing material in an incompatible container	Check for compatible uses of chemicals, particularly solvents or aggressive solutions. Check the material and construction of containers and equipment with a goal of maintaining structural integrity.
Breakage of thermometers or similar experimental equipment	Select equipment that has reduced potential for breakage, e.g., replace mercury thermometers and electronic temperature devices.

Appendix B, Discussion of Spill Response

Page 1 of 8

Acknowledgement:

Portions of the following are excerpted from the American Chemical Society's pamphlet "Guide for Chemical Spill Response Planning in Laboratories. Prepared by the American Chemical Society's CEI/CCS Task Force on Laboratory Waste Management American Chemical Society, Washington, DC 1995.

Introduction to Spill Response and Planning

Evaluate the Risks

The first step in evaluating whether a spill is "simple" is to estimate the risks created by the spill. In spill response, the key risks of concern are human health effects, property damage, and environmental damage.

When evaluating potential impacts, a prompt response can minimize adverse consequences. On the other hand, an inappropriate response can turn a simple spill into a complex situation.

Human Health Effects

Potential health effects is the most important hazard category to consider when deciding whether or not to attempt a spill cleanup. Some hazardous material releases may result in health hazards such as fires or explosions. Other hazardous material releases may present health threats because of their ability to spread rapidly and enter the body readily. A spill is not "simple" if it presents these risks.

If the potential for fire or explosion exists, seek outside assistance from trained emergency responders. Releases of flammable hazardous materials (liquid or solid) can present significant fire and explosion risks when one or more of the following is present:

- volatile vapors,
- water reactive or air reactive hazardous materials,
- ignition sources,
- oxidizers, and
- significant quantities of combustible materials.

Toxic vapors and dust are also hazardous. Avoid direct contact with such hazards because they spread quickly, are easily absorbed through the skin, and may damage tissue.

A hazardous material spill is not a health risk if it has a low toxicity (especially if it is not volatile or a dust), is not highly corrosive, and is not a strong oxidizer. Such spills may be considered "simple" only if physical damage or environmental factors are absent. When a spilled chemical's toxicity is unknown, treat the spill like a potential human health hazard by avoiding exposure and seeking outside assistance.

Appendix B, Discussion of Spill Response (continued)

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Physical Damage to Property

The potential for physical damage to property (Equipment, building materials, structures, or cleanup materials) also is important when determining whether you have a simple spill. Remember a common first response to a spill is to try to protect equipment and property, but any real threat to such items will also threaten the persons cleaning up the spill. Do not attempt to protect property if there are any human health or fire/explosion hazards present.

In addition to potential fire and explosion hazards, strong corrosives and oxidizers typically fall under the property damage category. If any hazards are present that would damage property, treat the spill as complex and contact the appropriate authorities.

Environmental Threats

Some laboratory spills have the potential for escaping into the environment. Spills may release into the atmosphere, discharge into the sewer system, or leak directly into soils or surface water. While few laboratory spills present environmental threats, it is necessary to notify the appropriate authorities if a spill has the potential to cause environmental damage. If you can do so safely, it may be prudent to take interim measures before the hazardous materials response team arrives, such as blocking a Spreading spill with absorbents or covering a floor drain with a rubber mat.

Though small amounts of some hazardous materials pose environmental problems, most environmental risks are presented by large-quantity releases of materials. A large-quantity release that threatens the environment is not a simple spill, but requires the attention of trained responders.

Evaluate Quantities

The next step to take when determining whether a spill is "simple" is to evaluate the quantity of material released. If a spilled hazardous material is not hazardous, its cleanup (without the assistance of an emergency response team) is dependent on the ability to control the spill, as well as the availability of sufficient spill control materials (e.g., an absorbent for liquids). Factors that may complicate a cleanup effort (such as the unique characteristics of a spill's surroundings or the restricted access to a spill) must be determined on a case-by-case basis.

If the spilled hazardous material is hazardous, the threshold quantity for a simple spill cleanup depends on the spilled chemical's physical properties and hazards. This quantity depends on situational factors such as

1. the training and experience of laboratory personnel,
2. the availability of spill control materials,
3. the availability of personal protective equipment, and
4. the physical layout of the spill location.

The more toxic, corrosive, or flammable a material is, the less likely that the spill can be defined as "simple". Thresholds for flammable liquids and solids, as well as volatile toxics, should be relatively low.

Appendix B, Discussion of Spill Response (continued)

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Spills of reactive hazardous materials should only be managed by trained responders (who may be in-house). In general, simple spill thresholds for liquids will be lower than the thresholds for solids. Additionally, simple spill thresholds for volatiles will be lower than the thresholds for non-volatiles.

Evaluate Potential Impacts

The third step to take when deciding whether a spill can be managed as a simple spill is to evaluate the potential broader impacts of the spill. A hazardous material spill in an area where its potential risks are magnified by specific situations (such as physical situations or the presence of a large number of people) should not be managed as a simple spill. For instance, the presence of boxes, hazardous materials, and other ignition sources would magnify the impact of a one-gallon release of acetone. Since acetone is highly flammable and volatile, this situation would be immediately dangerous to both human health and property, cleanup should be handled by and emergency responder.

Other factors that may magnify a spill's impact and require emergency response are

- the possibility that hazardous vapors or dusts might enter the building's ventilation system (and be distributed to other areas);
- the possibility that spilled liquids might flow into other areas, this expanding the threat of harm (such as reaching ignition sources, exposing other people, damaging delicate equipment);
- the presence of incompatible hazardous materials;
- the proximity of classrooms or offices containing people who could be harmed by the spill's consequences; and
- spills in sinks that might be connected to other sinks through the plumbing system.

To determine whether a spill is simple or complex (which is often the hardest part of spill response), you need to know (1) the hazard(s) posed by the spilled hazardous material and d(2) the spill's potential impact. Both these factors are, in large part, determined by the spill's size. The following information will help you determine whether you have a simple spill:

- the type of chemical(s) spilled,
- the amount,
- the hazardous characteristics of the spilled chemical(s),
- the location,
- the proper method for cleaning up the spill,
- the personal protective equipment available, and
- the training of the laboratory's personnel.

Training and Authorization for Spill Response:

To remediate a simple spill, a worker must have all required site-specific training for the work location and work activity and be authorized under the IWD governing the work which produced the spill.

Appendix B, Discussion of Spill Response (continued)

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Spill Response Steps and Discussion:

The steps to follow in spill response are located in section 8 of this procedure. The following additional information is provided.

More Detail: SOLIDS & LIQUIDS

Make a decision on whether to evacuate immediate area of the spill. If the spill is outside your lab fume hood or other containment and ventilated areas, evacuation of the lab will often be necessary. If you are unsure about the need for lab evacuation, get out. For spills of solids or liquids, it will often not be necessary to evacuate other areas, since labs with hazardous materials are normally under negative pressure with respect to the surrounding areas. Take note of the identity and quantity of the spilled material upon leaving your lab.

Determine the need for evacuation of additional areas. If you are using a highly hazardous material and have reason to believe it can enter the hallway, please do not hesitate to pull a fire alarm if you feel the need for building-wide evacuation. If only lab evacuation is necessary, post a sign, or better yet a person, outside each lab entrance to assure others do not enter.

When you contact your RLM and Operations Manager, you should do it from a safe location. Unless you have persons to help you secure the lab, it is best to phone from a location where you can see the lab entrance to keep people away.

Cleanup A Simple Spill

Spills are a reasonable "what-if" hazard that should always be considered when developing IWDs and local procedures. Any non-routine controls should be established in these documents to allow involved workers to respond to simple spills in a pre-planned way that authorizes them to respond to simple spills and equips them with the equipment and materials needed to do so. If the spill presents hazards beyond those in the IWD or local procedure – then the involved worker, the First Line Manager, ESH and the Operations Manager should agree on a spill response. Involved workers must have the right personal protective equipment and exposure monitoring:

- including, at a minimum, appropriate eye protection, protective gloves, and a lab coat.
- additional protective equipment may be required for spills that present special hazards (such as corrosive or reactive spills or spills that have a splash potential).
- as a rule of thumb, if you need a respirator, you should request outside assistance because you do not have a simple spill unless specific planning is included in approved work control documents to address this case.

The following steps should be taken during simple spill cleanup. Most importantly, before cleaning up a simple spill, be sure that you can do so safely.

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Prevent the spread of dusts and vapors

If the substance is volatile or can produce airborne dusts, close the laboratory door and, where possible, the facility Operations Manager can increase ventilation (through fume hoods, for example) to prevent the spread of dust and vapors to other areas. **Neutralize acids and bases, if possible.**

Spills of most liquid acids or bases, once neutralized, can be mopped up and rinsed down the drain (to the sanitary sewer). However, be careful because the neutralization process is often vigorous, causing splashes and yielding large amounts of heat. Neutralize acids with soda ash or sodium bicarbonate. Bases can be neutralized with citric acid or ascorbic acid. Use pH paper to determine when acid or base spills have been neutralized.

Control the spread of the liquid

Contain the spill. Make a dike around the outside edges of the spill. Use absorbent materials such as vermiculite, cat litter, or spill pillows.

Absorb the liquid

Add absorbents to the spill working from the spill's outer edges toward the center. Absorbent materials, such as cat litter or vermiculite, are relatively inexpensive and work well, although they are messy. Spill pillows are not as messy as other absorbents, but they are more expensive. Note that special absorbents are required for hazardous materials such as hydrofluoric and concentrated sulfuric acids.

Collect and contain the cleanup residues

The neutralized spill residue or the absorbent should be scooped, swept, or otherwise placed into a plastic bucket or other container. For dry powders or liquids absorbed to dryness, double bag the residue using plastic bags. Additional packaging may be required before the wastes can be transported from your laboratory. For spills of powders or solid materials, you may need to add a dust suppressant. Be sure to place descriptive labels on each container.

Dispose of the wastes

Keep cleanup materials separate from normal trash. Contact your environmental health and safety officer for guidance in packaging and labeling cleanup residues. Promptly place cleanup wastes in an appropriate hazardous waste receptacle.

Decontaminate the area and affected equipment

Ventilating the spill area may be necessary. Open windows or use a fan unless the area is under negative pressure. In some instances, your environmental health and safety officer can test the air to ensure that hazardous vapors are gone. For most spills, conventional cleaning products, applied with a mop or sponge, will provide adequate decontamination. If you have any question about the suitability of a decontaminating agent, seek expert advice.

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Special Precautions

The following precautions apply to hazardous materials that have hazardous characteristics. Note that some hazardous materials may exhibit more than one characteristic.

Spill Mitigation for Nano Materials:

- Contact the Emergency Operations at 7-6211 in the event of a large spill (i.e., a spill that cannot be safely contained by the engineered nanoparticle worker).
- Contact the Sanitary Waste Water System office at 7-7711 if nanoparticle spills occur down sanitary drains.
- Engineered nanoparticle workers will determine the extent of the area affected, and demarcate it with barricade tape or use another reliable means to restrict entry into the area.
- Allow trained personnel to clean up smaller spills, following the approved cleanup procedures listed in the IWD.
- Refer personnel exposed to nanoparticles in the course of a spill to Occupational Medicine.
- Manage all debris and waste resulting from the cleanup of a spill as though it contains engineered nanoparticles.

Flammable Liquids

Remove all potential sources of ignition. Vapors are what actually burn, and they tend to accumulate near the ground.

Flammable liquids are best removed through the use of spill pillows or pads. Spill pads backed with a vapor barrier are available from most safety supply companies. Because flammable liquids will probably be incinerated, avoid using inert absorbents such as cat litter. All used absorbent materials should be placed in heavy-duty poly bags, which are then sealed, labeled, and disposed through your facility's hazardous waste management program. Before resuming work, make sure the spill area has been adequately ventilated to remove flammable vapors.

Volatile Toxic Compounds

Use appropriate absorbent material to control the extent of the spill. Spill pillows or similar absorbent material usually work best because they do not have the dust associated with cat litter, vermiculite, or corn cobs. Place all used absorbent materials in heavy-duty poly bags. Seal the bags, label them, and hand them over to your facility's hazardous waste management program. Again, make sure the spill area has been adequately ventilated before resuming work.

Direct Contact Hazards

Carefully select suitable personal protective equipment. Make sure all skin surfaces are covered and that the gloves you use protect against the hazards posed by the spilled chemical. Often it is a good idea to wear two sets of gloves: one as the primary barrier, the second as a thin inner liner in

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the event the primary barrier fails. When the cleanup is completed, be sure to wash hands and other potentially affected skin surfaces.

Mercury Spills

Mercury spills rarely present an imminent hazard unless the spill occurs in an area with extremely poor ventilation. The main exposure route of mercury is via vapor inhalation. Consequently, if metallic mercury is not cleaned up adequately, the tiny droplets remaining in surface cracks and crevices may yield toxic vapors for years.

When a mercury spill occurs, first cordon off the spill area to prevent people from inadvertently tracking the contamination over a much larger area. Generally, a special mercury vacuum cleaner provides the best method of mercury spill cleanup. DO NOT use a regular vacuum cleaner because you will only disperse toxic vapors into the air and contaminate your vacuum cleaner. If a special mercury vacuum is not available, first use an appropriate suction device to collect the big droplets, then use a special absorbent (available from most laboratory supply vendors) to amalgamate smaller mercury droplets.

Ideally, mercury spills should be prevented in the first place. Examine all uses of mercury to see if substitutes are available. If substitutes are not available, use trays or other equipment to provide spill containment. Spilled mercury often accumulates in sink traps. Be prepared to contain the mercury when servicing such facilities.

THINGS TO REMEMBER

Don't walk through the spill.

Don't dilute the spill or disturb it in other ways without first diking around the perimeter of the spill with pillows or other spill absorbent materials.

If a spilled material has contacted any part of your body, start first aid measures immediately. Shout for help and move directly to the nearest eyewash or shower. Disrobe promptly if clothing is involved. Flush for a minimum of 15 minutes whether eyes or skin are involved. Other persons should assist (you will need help with eye flushing) and should contact 911 at the earliest possible time to obtain additional assistance and further treatment.

Decontamination

Decontamination is the process of physically removing or neutralizing contaminants that have accumulated on personnel and equipment; the last step of spill cleanup.

Date

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Evaluate the following. Are they contaminated?

- All cleanup supplies and equipment (brooms, dustpans, shovels, containers, pipettes, suction tubes, sponges, vacuum cleaners, monitoring equipment, etc.)
- Personal protective equipment (hazardous material suits, respirators, gloves, boots, aprons, etc.)
- Any additional equipment in the area may have been contaminated during the spill or release, but may not be obvious. Examples might include analytical and/or computer equipment (particularly for releases of dusts), glassware, bench tops, etc.
- The probability and extent of permeation is directly linked to the length of contact. The longer the contact, the more effort that will be required to decontaminate.
- Loose contaminants such as dust or vapors may be removed by scrubbing, washing, and rinsing.
- Adhering contaminants such as resins and muds may require physical removal by brushing and wiping.
- The effectiveness of this removal may be improved by solidifying, freezing, and absorption procedures.

Appendix C, Recommended Components of a Laboratory Hazardous Material Spill Kit

Instructions:

- PICs shall prepare and maintain spill kits appropriate for the activity. ESH/WS staff shall prepare and maintain spill kits appropriate for the facility and to address major potential spill hazards in the facility.
- The following is a sample of a spill kit inventory checklist.

Item	Requirement	Inventory Checked by Initials and Date
Kit Basic Requirements	• Tool Kit. Bucket etc. to hold necessary materials. • Kit should be stationed in accessible locations that are visible • Kit should be inventoried routinely and secured by a tamper indicating device to prevent pilfering of materials	
Barrier Materials	• Safety rope – 100' • Safety tapes / ribbon 100' • Warning signs – 5 • Tape - roll	
Absorbents	• Paper towels (two rolls) • Pillows and brooms • Sheets and pads • Loose bulk absorbents (e.g., cat litter)	
Residue Management	• Whisk broom or hand-held brush • Plastic dust pan • Metal dust pan • Large, sealable (e.g., Ziploc) plastic bags • 5-gallon plastic drum liners • 5-gallon waste disposal container with lid	
Personal Protective Equipment (PPE)	• Hazardous material splash goggles • Face shields • Gloves (proper elastomer for the material in the lab) • Appropriate body protection, such as o Lab coat o Elastomeric aprons o Tyvek suits o Shoe/foot coverings	
Emergency Equipment (should be close at hand and documented in the IWD)	• Respiratory Protection (if applicable) • Neutralizers (citric acid, sodium bicarbonate, etc.) • Special reactants (chelating agents, etc.) • Decontaminants and biostats (e.g., for blood-borne pathogen cleanup) • Specialized PPE • Mercury Spill Kit (unless it is known that there is no mercury in the laboratory)	

Date

STO-OP-043, R 1

STO Generator Waste Operations

Effective Date: 13 March 2014
Supersedes: STO-OP-043, R0
Next Review Date: 13 March 2017

Hazard Class: ☒ Low ☒ Moderate ☐ High/Complex
Usage Mode: ☒ Reference ☐ UET UET Sections: ____________
Status: ☐ New ☒ Major revision ☐ Minor revision ☐ Reviewed, no change

Approval Signatures

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Classification Review

☒ Unclassified ☐ UCNI ☐ Classified

Name	Z#	Signature	Date
Ed Pitchkolan	199035	[signature]	3/13/14

Revision History

Document Number and Revision	Effective Date	Action
STO-OP-043, R 1	03/13/2014	Periodic Review
Description Reference to TA55 removed. Update contact information. Update Organization Name Revised to new format as part of the periodic review. (Ref: P315, Sections 16.5.2.)		
STO-OP-043, R0	03/13/2012	Periodic review, minor Revision
Description Update LANL WAC changes, addition of WCATS references, update responsibilities, grammatical corrections. Issued new number for consistency..		
STO-PRO-0511, R0-EXT1		New
Description		

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

This document defines the waste generator's responsibilities for the identification and management of waste within Science and Technology Facility Operations Division (STO)-supported facilities for the STO Facility Waste Certification Program (FWCP). The STO FWCP serves to protect the worker and to ensure the protection of the public and the environment as part of the Los Alamos National Laboratory (LANL) Environmental Management System (EMS).

Complying with the requirements in this document for chemical and radioactive waste assures compliance with the requirements in LANL Procedure P409, Waste Management; LANL Procedure P930-1, LANL Waste Acceptance Criteria (WAC); LANL institutional policies and procedures; Code of Federal Regulations (CFR) 40, Protection of Environment; Department of Energy (DOE) Orders; and LANL's "Green is Clean" program.

This document also addresses the criteria to be used for segregating LLW and "Green is Clean" waste in Radiological Controlled Areas (RCAs), controlled for surface or volume contamination.

1.2 Scope and Applicability

This procedure provides waste generators within STO-supported facilities with instructions for the characterization, management, and disposition of chemical and low-level radioactive waste (LLW). This procedure is part of the STO FWCP.

This procedure applies to all chemical and low-level radioactive (whether located in a RCA or <u>not</u>) waste and personnel performing waste operations within STO-supported facilities.

This document is divided into <u>four</u> instructions:
- Hazardous Waste
- Radioactive Waste
- Universal Waste
- Biological Waste

2.0 PRECAUTIONS AND LIMITATIONS

N/A

3.0 PREREQUISITE ACTIONS

N/A

4.0 ACCEPTANCE CRITERIA

N/A

5.0 WORK STEPS

This Instruction is a stand-alone sub-section and **may** be performed independently of, or in conjunction with, other Instruction sub-sections.

5.1 Requirements

NOTE *Failure to comply with all requirements in this document could result in serious disciplinary action.*

All hazardous waste **SHALL** be accumulated in a SAA or < 90 Day Area, properly labeled, and in closed containers. The LANL WAC is constantly changing but following the requirements in this document will assist in satisfying the requirements in the WAC. DSESH-STO Waste Management personnel keep up-to-date with WAC requirements, and will assist in complying with these requirements.

STO supports research and development organizations with a wide diversity of research operations and waste streams. It is difficult to provide specific guidance in this document for every possible waste stream. Most hazardous wastes generated are aqueous, solvents, metal powders, and laboratory trash contaminated with solvents and/or metals. Appendix 1, Hazardous Waste Disposal Process Flow Chart, illustrates the STO hazardous waste disposal process.

Notify waste management personnel of all anticipated waste streams and for assistance with waste determination and classification. If uncertain about the type of waste to be generated or being generated, immediately notify your WMC.

5.2 Waste with No Disposal Path

The only known non-radioactive waste stream with no disposal path at this time is:

- F027 waste containing chlorophenols or their derivatives (unused/unspent dioxin waste e.g., silvex or 2,4,5-trichlorophenol).

This waste stream is <u>not</u> to be generated. Special DOE approval is required before generating this waste stream. If you **MUST** generate this waste stream, contact your WMC for assistance.

Problematic Waste is waste that for some other reason cannot be accepted by the intended TSDF within one year of acceptance into storage or will be extremely expensive to ship, treat, and/or dispose.

5.3 Waste Handling Precautions

Individuals using and/or handling chemicals **MUST** know the chemicals used in each operation and the products of any reactions. Compliance with the LANL Chemical Safety Program requirements for handling the chemicals is required. Contact the DSESH-STO Industrial Hygiene and Safety (IHS) representative for assistance.

5.4 Generator Authorization

Only authorized SAA users are allowed to generate and store hazardous waste. Short-term visitors **may** generate waste but their sponsor is responsible for the waste. In order to become an authorized user, waste generators **MUST** complete the applicable training requirements, at a minimum Waste Generation Overview (WGO) Live training course number 23263 followed by WGO Refresher course number 21464 every three years and be assigned curriculum number 2810, Hazardous Waste Generator, in UTrain.

A list of all Authorized Users **MUST** be posted at every SAA within a STO-supported facility and reviewed and/or updated at least annually. Contact a WMC when waste is generated by an individual <u>not</u> on the SAA authorized user list.

5.5 Approved Users

Each SAA within a STO-supported facility has a custodian who has oversight of the SAA to help with ensuring that waste generators maintain the storage requirements for that SAA. The SAA custodian must post an Authorized Users list and keep it up-to-date.

When the WMC supplies an Authorized Users list for the SAA custodian, all Authorized Users are also Approved Users for each SAA unless the SAA custodian indicates otherwise. Custodians approve only specific users for their SAA by:

- Supplying an Authorized User List or
- Highlighting the authorized user's names on the WMC provided authorized user list in the SAA including themselves

Contact your WMC to get a non-authorized worker on the authorized/approved user list for a SAA.

5.6 Waste Minimization

Waste generators are required to make every effort to reduce the amount of hazardous waste generated as much as is technically and economically feasible. Waste can be minimized through the following methods:

- Material substitution
- Reducing waste at the source
- Surplus chemicals in ChemLog
- Good housekeeping
- Segregating non-hazardous materials
- Recycle
- Salvage
- Maximizing the packing efficiency of waste containers
- Decontaminating when appropriate
- Using disposal as the final option

Waste minimization practices are to be incorporated into waste-generating activities and included in procedures. Waste management **should** review documents (e.g., Integrated Work Documents and procedures) that generate a waste to provide waste minimization assistance.

5.7 Hazardous Waste Determination

Each waste stream **MUST** be classified before or at the time of generation in order to ensure that the waste is managed and disposed of properly. Your WMC can be contacted to obtain a waste classification and for assistance with completing a Waste Profile Form (WPF).

IF a material is determined to satisfy one of the following criteria,

- Cannot be reused
- Cannot be used for its intended purpose
- Has exceeded its shelf life
- Has no known owner or generator
- Is no longer wanted or needed
- Is an end product of a process or experiment that cannot be used as feedstock in an existing process

THEN the material is **WASTE**.

A waste stream is not allowed to be altered in any manner that could be considered treatment. RCRA does allow some treatment such as elementary neutralization or treatability studies but Water Quality And RCRA Group requires documentation prior to such treatment. Contact your WMC for assistance with waste treatment.

Examples of **illegal** waste treatment:

- Leaving solvent wetted wipes in a hood or on the bench top to air dry.
- Leaving a container open to allow the waste to evaporate.
- Pouring an unapproved waste into a drain.
- Diluting a waste to render it non-hazardous.
- Venting a pressurized aerosol can solely to remove the propellant.

5.7.1 Solvents

Most organic solvents and alcohols have a flash point of less than 140 °F, which means they are a hazardous waste while they are in liquid form. F-listed RCRA solvents are listed for two characteristics: toxicity and ignitability.

F001, F002, F004, and F005 solvents are listed for toxicity, which means they and anything they come in contact with, are always a hazardous waste. Wipes/rags used with these solvents **SHALL** be collected as a hazardous waste even if the wipes/rags dry during the process. The solvents are:

Tetrachloroethylene	1,1,2-Trichloro-1,2,2-trifluoroethane	Toluene
Trichloroethylene	Ortho-dichlorobenzene	Methyl ethyl ketone
Methylene chloride	Trichlorofluoromethane	Carbon disulfide
1,1,1-Trichloroethane	1,1,2-Trichloroethane	Isobutanol
Carbon tetrachloride	Cresols	Pyridine

5.7.1 Solvents (cont.)

Chlorinated fluorocarbons	Cresylic acid	Benzene
Chlorobenzene	Nitrobenzene	2-Ethoxyethanol
2-Nitropropane		

F003 solvents are listed solely for ignitability, which means that wipes/rags that are still soaked with the solvents **SHALL** be collected as a hazardous waste. Wipes/rags that dry during the process **may** be thrown into the trash. This includes other ignitable solvents <u>not</u> listed such as ethanol, isopropanol, propanol, kerosene, etc. The F003 solvents are:

Xylene	Ethyl benzene	n-Butyl alcohol
Acetone	Ethyl ether	Cyclohexanone
Ethyl acetate	Methyl isobutyl ketone	Methanol

Contact your WMC for further guidance on solvents and alcohols.

5.7.2 Ignitable Waste

Other types of waste that satisfy the ignitability characteristic and are a hazardous waste are:

- <u>Liquids</u> with a flash point of less than 140 °F
- <u>Ignitable non-liquids</u>: such as powders of metal and non-metal materials including aluminum, boron, bronze, cadmium, carbon, copper, chromium, hydrides, iron, manganese, rhenium, silicon, silver, stainless steel, tantalum, tin, titanium, titanium boride, titanium diboride, tungsten, zirconium, zirconium carbide, zinc
- <u>Ignitable compressed gas</u>: this includes some aerosol cans that still contain propellant and nonreturnable compressed gas cylinders
- <u>Department of Transportation (DOT) oxidizers</u>: chromium trioxide, hydrogen peroxide, lead oxide, magnesium peroxide, manganese dioxide, all nitrates

Contact your WMC for further guidance on powders and oxidizers.

5.7.3 Corrosive Water

Many acids and bases satisfy the corrosivity characteristic even when they are dilute.

A corrosive hazardous waste exists when:

- The pH is less than or equal to 2
- The pH is greater than or equal to 12.5
- A liquid that corrodes steel at a specific rate as defined in 40 CFR Part 261.22(a)(2)

Contact your WMC for further guidance on corrosive waste.

5.7.4 Reactive Waste

RCRA has a specific definition for reactive waste. A reactive waste exists when the material:

- Is normally unstable and readily undergoes violent change without detonating
- Reacts violently with water
- Forms potentially explosive mixtures with water
- Is cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment
- Is pyrophoric (spontaneously ignites in air)
- Is shock sensitive
- Is an explosive

The EPA does not provide analytical methods for reactive waste therefore reactivity must be determined by the manufacturer and/or the waste generator. Contact your WMC for further guidance on reactive waste.

5.7.5 Toxic Waste

RCRA has 40 metals and chemicals listed for toxicity. If any of these materials contaminate the waste stream at a level greater than or equal to a few Parts Per Million (ppm) (indicated in parentheses) as determined through AK or the toxicity characteristic leaching procedure, then the waste stream is a hazardous waste. The most common of these materials used in STO-supported facilities are:

- Metals: arsenic (5.0), barium (100.0), cadmium (1.0), chromium (5.0), lead (5.0), mercury (0.2), selenium (1.0), silver (5.0)
- Chemicals: benzene (0.5), chloroform (6.0), cresol (200.0), methyl ethyl ketone (200.0), nitrobenzene (2.0), pyridine (5.0), trichloroethylene (0.5)

Fluorescent lamps contain 10 to 40 milligrams of mercury, and incandescent bulbs have a lead solder joint and a lead contact point, therefore they **MUST** be managed as a Universal Waste (see Instruction 7 of this document). If these types of lamps or bulbs are contaminated with radioactive material or chemicals (e.g., beryllium) that do not allow them to be recycled, then they **MUST** be managed and disposed of as a Hazardous Waste. Contact your WMC for further guidance on toxicity characteristic waste and for assistance with waste lamps and bulbs.

5.7.6 Electroplating Waste

There is one electroplating shop in STO-supported facilities, Sigma (TA-03-0066). In electroplating operations, a hazardous waste exists for any waste stream that satisfies one of the following F-listed waste streams:

- Wastewater treatment sludges from electroplating operations; because of this F-listed waste, **NO** electroplating waste (including rinse water) can be sent to the Radioactive Liquid Waste Treatment Facility (RLWTF)
- Spent cyanide plating bath solutions from electroplating operations
- Plating bath residues from the bottom of plating baths associated with electroplating operations where cyanides are used in the process
- Spent stripping and cleaning bath solutions associated with electroplating operations where cyanides are used in the process

Note *The F listings only apply to electroplating waste streams. It does not apply to electroless plating or nonelectroplating cleaning baths even though they are in an electrochemistry laboratory. Contact your WMC for assistance in determining if the F-codes apply to the waste and whether or not RLWTF acceptance is a possibility.*

5.7.7 Unused/Unspent Chemicals

RCRA has two classifications for specific unused/unspent chemicals that are hazardous wastes when they are discarded; these two classifications are U-list and P-list. Other discarded chemicals **may** be regulated under RCRA if they exhibit a characteristic. For unused/unspent (opened or sealed) chemicals that are no longer needed, attempt to find another home for the chemical. As a last option, contact your WMC for disposal of the unused/unspent chemicals.

Acute hazardous waste (P-list) exists when the unused/unspent chemical or the empty container that contained the P-listed material is discarded. The empty containers **SHALL** be managed as a hazardous waste. The most common of these materials used in STO-supported facilities are:

- Beryllium metal powder
- Cyanides
- Thallium oxide
- Vanadium pentoxide

Contact your WMC for further guidance on unused/unspent chemical waste.

5.7.8 Orphan Waste

No waste is to be left behind when moving out of a STO-supported facility. STO requires the Workspace Inspection Form 1669 be completed when moving out of a STO-supported facility. Complete the form at least two weeks in advance of moving out of a STO-supported facility.

IF an unknown/orphan waste is discovered, **THEN:**

- Do <u>not</u> open the container
- Do <u>not</u> move the container if it could potentially be shock sensitive
- Immediately contact your WMC who will assist with the handling of the orphan waste:
  - Store the waste in a SAA or <90 Day Area
  - Physically segregate it from other waste
  - Have it analyzed and keep a copy of the Request For Analysis form with the container
  - Dispose of the orphan waste

The <u>full</u> characterization analysis of orphan waste will cost a minimum of $1,500.

5.8 Characterization

The following are types of characterization used in STO-supported facilities:

- <u>Acceptable Knowledge (AK)</u>: The Integrated Work Documents (IWDs), logbooks, and other work documents serve as AK documentation. Give the identifying number to your WMC when completing a WPF. If the waste is generated from a non-specific process with no documentation, your WMC will assist in writing the AK in the “Additional Information” section of the WPF.
- <u>Chemical/Physical Analysis</u>: When analysis is required, your WMC submits a “Request for Analysis” and will assist with the WPF when the results are received. The waste is to be labeled and properly managed until the results of the analysis are known.
- <u>Material Safety Data Sheet (MSDS)</u>: MSDSs are almost always used because the information provided for contents and characteristics are necessary for completing the WPF and making a waste classification.

NOTE *Residues from treatability study experiments **MUST** be characterized by chemical/physical analysis.*

Your WMC **MUST** be notified of any changes that affect the characterization of a waste stream. Submit a STO Service Request when analysis of a waste stream is needed, and provide all the information requested on the Service Request, including the cost account information for costs associated with the analysis. A pdf file of the chemical/physical analysis results **MUST** be attached to the WPF in WCATS when it is submitted. The only MSDSs that must be attached to WPFs are those for trade name materials (e.g., WD-40).

5.8.1 Waste Profile Form (WPF)

The WPF serves as the characterization documentation for a waste stream. Contact your WMC for assistance in completing a WPF. The individual completing a WPF is responsible for ensuring that:

- The information on the WPF is accurate and best describes the waste stream
- Each waste stream is on a separate WPF

NOTE *Classified waste is not exempt from these requirements and requires a WPF. Do not put classified information in the WPF.*

Each WPF is active for one year. An email will be sent to the WPF owner from WCATS notifying the owner that the WPF **MUST** be reviewed to determine whether the WPF still satisfies the waste stream. If the WPF is still applicable, the owner extends the WPF for a year through WCATS.

5.8.2 Empty Containers

Containers less than or equal to 110 gallons in size are considered empty if the following requirements are satisfied:

- All of the material has been removed that can be removed using the practices commonly employed to remove the material from that type of container (e.g. pouring or pumping)
- No more than one inch of residue remains in a drum or no more than three percent by weight of the total capacity remains in the container

NOTE *Empty nonreturnable compressed gas cylinders (except those that contained a P-listed material) can be sent to metals recycle when the cylinder has been punctured, had the valve removed, or had a wire placed through the open valve.*

Empty containers less than 30 gallons in size can be disposed of as municipal refuse waste (in the trash) unless they contained a P-listed material as discussed previously in Section 5.7.7. Aerosol cans must be empty of both the liquid and propellant but cannot be thrown in the trash. An empty container 30 gallon in size or greater **MUST** have an MSDS for the material it contained for disposal.

Contact your WMC for assistance in disposing of empty containers that are greater than or equal to 30 gallons and empty aerosol cans.

5.9 Storage

All hazardous and mixed waste **MUST** be accumulated and/or stored in a Hazardous Waste Satellite Accumulation Area (SAA) or a Hazardous Waste Less Than 90 Day Storage Area (< 90 Day Area). Always keep the SAA or < 90 Day Area free of obstacles or deterioration that could cause a spill, accident, or prevent access by emergency personnel and equipment.

For a large volume (55 gallons or greater) generation of hazardous waste that cannot be stored in a SAA, immediately contact your WMC.

NOTE *Non-hazardous waste is not required to be stored in a SAA or < 90 Day Area.*

LANL requirements allow the storage of flammable materials without fire protection (e.g., cabinet or fire safe can) up to 5 gallons per 100 square feet of floor space. If a generation will exceed this limit a fire safe cabinet or other means of fire protection for the SAA is required. Also, Appendix 2, NFPA Flammable Material Volume Limits, is the National Fire Protection Agency (NFPA) flammable material volume limits for different container types.

5.9.1 Segregation

Waste streams **SHALL** be segregated. Keep:

- Liquids and solids in separate containers
- Hazardous and non-hazardous waste in separate containers
- Hazardous and radioactive waste in separate containers

Hazardous waste **MUST** be physically segregated (e.g., separate spill trays or cabinets) from the following while in storage:

- Non-hazardous waste
- Incompatible waste
- Mixed waste
- Radioactive waste
- Product chemicals

DSESH-STO waste management **may** have some containers and spill trays available for waste. Contact your WMC for further guidance on segregation.

5.9.2 Compatibility

Hazardous waste streams **MUST** be compatible with the:

- Container
- Spill containment
- Other waste in the same spill containment

Take every precaution to ensure incompatible materials (such as oxidizing acid and organic solvents or cyanides and acids) CANNOT be placed in the same waste container.

Contact your WMC or DSESH-STO IHS representative for further guidance on compatibility.

NOTE ***NEVER*** *shall reactive cyanides and acids be stored or packaged together.*

5.9.3 Containers

NOTE *EPA explained that the purpose of the closed container requirement is "to minimize emissions of volatile wastes, to help protect ignitable or reactive wastes from sources of ignition or reaction, to help prevent spills, and to reduce the potential for mixing of incompatible wastes and direct contact of facility personnel with waste."*

Outer hazardous waste containers **MUST** be:

- Sealed/closed to the EPA's intent
  - — the only time a hazardous waste container can be open is when waste is actively being put into the waste container
- Compatible with the waste
- In good condition
  - — immediately replace deteriorated or damaged containers

Examples of <u>noncompliant open containers</u>:

- Step-on cans that do not close properly
- Zip lock bags <u>not</u> completely sealed
- Wipe caught in the seal of a zip lock bag
- Lid completely off the container
- Lid loose on the container
- Wrong lid on a container
- Container leaks from the lid when sealed properly
- Funnel type lids that do not seal/close to meet the EPA's intent
- Cracked container
- Tear or a pinhole in a bag

DSESH-STO waste management can assist with the purchase of DOT rated shipping containers and **may** have containers available. Contact your WMC for further assistance with containers.

5.9.4 Hazardous Waste Satellite Accumulation Area (SAA)

A SAA is allowed to accumulate up to 55 gallons of hazardous waste or one quart of acutely hazardous waste. The SAA **MUST** be located as close to the point of generation as possible. A SAA **may** not serve waste generators on different floors unless approved by the Water Quality And RCRA Group.

To use an existing SAA, contact the SAA custodian listed on the posting and ask permission to accumulate/store waste in the SAA. Ensure your name is on the Authorized Users list.

To establish a new SAA, contact your WMC who will:

- Review the site
- Complete the applicable LANL registration
- Post the appropriate signage
- Provide labels
- Determine whether a secondary containment is needed (secondary containment **MUST** hold 110% of the volume of the largest container)
- Check the area for possible ignition sources
- Ensure that the egress is not blocked
- Ensure that segregation of incompatible wastes is possible
- Ensure the acceptable storage for flammable waste
- Brief the SAA custodian and generators on the postings and requirements for the SAA

Once a SAA has been established, do not move the SAA without first contacting your WMC. If a SAA or the postings need to be moved, contact your WMC for assistance.

5.9.5 SAA Volume Limit Exceeded

IF the volume limit in a SAA is exceeded, **THEN:**

- Date each container that causes the volume limit to be exceeded
- Remove the waste within three calendar days

Immediately contact your WMC to move the waste to a < 90 Day Area or TSDF.

5.9.6 Daily Accumulation

While accumulating waste during the work day, the requirements of this document **MUST** be satisfied. Waste **MUST** be collected in a closed and labeled container.

The only time a container is allowed to be open is when waste is being physically added to the container. The best way to satisfy the requirements for laboratory trash (e.g., wipes and gloves) is to use labeled wide mouth poly bottles on bench tops, in gloveboxes, and in hoods

5.9.7 Hazardous Waste <90 Day Storage Area (<90 Day Area)

All Hazardous Waste < 90 Day Storage Areas under the control of the waste generator must be reviewed and assessed by your WMC. All <90 Day Area workers must be assigned curriculum number 293, Less-Than-90-Day Storage Area Worker, in UTrain and maintain their RCRA Personnel Training course number 7488 or RCRA Refresher Self-Study number 28582 complete. It is a **RCRA violation** to work in a <90 Day Area unsupervised when this training is expired or incomplete.

< 90 Day Areas are limited by time, not by volume. Waste placed in < 90 Day Areas **MUST** be characterized and transferred to a TSDF within 90 calendar days. The 90 day period starts once waste accumulation begins in a container but a disposal request must be submitted by day 30. If waste is added to that same container at a later date, do not change the date.

In a < 90 Day Area, each container **MUST** be:

- Closed
- Labeled or clearly marked with the words "Hazardous Waste"
- Marked with the accumulation start date

The following items **MUST** be available in < 90 Day Areas:

- Copy of the most recent LANL Contingency Plan
- The < 90 Day Accumulation Area-Emergency and Site Specific Plan
- Spill control for the types of waste stored
- Personnel decontamination equipment (if the type of waste managed does not require decontamination equipment, a justification memo must be supplied by an industrial hygienist or safety professional)
- Fire emergency equipment
- Communication equipment (in < 90 Day Areas where a cellular phone is carried onsite to satisfy this requirement, never open the < 90 Day Area without the phone and a charged battery)
- Secondary containment for liquids

It is highly recommended to organize all of the documents and forms in a binder and place the binder in the < 90 Day Area and also to post a copy of the < 90 Day Accumulation Area-Emergency and Site Specific Plan.

5.9.8 Hazardous Waste <90 Day Storage Area (<90 Day Area) (cont.)

The following requirements **MUST** be satisfied for < 90 Day Areas:

- Test and maintain the spill control, decontamination, emergency, and communication equipment:
  - — Inspect or test portable decontamination equipment weekly, and change the solution as required for the portable unit used
  - — Maintain the spill control supplies and replenish, as necessary
  - — Take care of the cellular phone and keep the battery charged
  - — Maintenance of the fire emergency equipment is ensured by STO
- <u>Do not</u> handle, open, or store containers in a manner, which **may** cause them to rupture or leak
- <u>Do not</u> mix incompatible wastes and/or materials in the same container
- <u>Do not</u> place hazardous waste in an unwashed container that previously held an incompatible waste or material
- Maintain a minimum aisle space of two feet
- Inspect equipment and containers using the LANL Hazardous/Mixed Waste Facility Inspection Record Form For <90 (IRF) at least weekly and when there is waste activity
  - — File the original IRFs in your waste management files

NOTE ***NEVER*** *shall reactive cyanides and acids be stored or packaged together.*

5.10 Labeling

Each outer container holding hazardous waste **MUST** be labeled with the appropriate labels or marked clearly as specified below:

- Labeled or clearly marked with the words “Hazardous Waste”
  - — <u>Do not</u> use words such as used, dispose, no good, or waste
- Generator’s name
  - — <u>Do not</u> use initials
- Generator’s telephone number
- Waste Profile Form (WPF) or Waste Stream Identification (WSID) number
- Major hazardous constituents
  - — Spell out the name of each chemical that causes the waste to be a hazardous waste
- For waste contaminated with beryllium “Danger Contaminated With/Contains Beryllium”
- For a mixed waste “Caution Radioactive Material – Radioactive Waste” or “Caution Radioactive Waste”
  - — If the waste is a mixed waste, then ensure that the requirements of Section 6, Instructions-Low Level Radioactive Waste, are also followed.

NOTE *<u>Do not</u> date any hazardous waste containers in a SAA when the volume limit has <u>not</u> been exceeded. The date would falsely indicate that the volume limit has been exceeded.*

5.10 Labeling (cont.)

Ensure that all written information is legible. If necessary, cover the label with clear packing tape to protect the ink. Signs of waste spillage can lead to a RCRA violation. For used chemicals, such as a solvent, that is not a waste because it can be reused, mark the container with the words "For Reuse." Do not mark the container "used" as this indicates it is a waste.

DSESH-STO waste management supplies the appropriate labels for use in SAAs. Appendix 3, Hazardous Waste Labels, illustrates the two labels supplied by waste management for hazardous waste. Contact your WMC for labels.

5.11 Controls

NOTE *SAAs where the administrative control requirements are not satisfied **MUST** be physically controlled. Using physical controls, the SAA **MUST** be locked when no waste generator is present. Outdoor SAAs and containers **MUST** be physically controlled.*

SAAs **MUST** be under the control of the operator using either physical or administrative controls. STO uses administrative controls and they are partially maintained by the DSESH-STO waste management organization. The following are required to satisfy the administrative control requirements:

- Post the SAA contact (custodian)
- Post the authorized users list
- Write the WPF or WSID number on the container
- Write the generator's name on the container

Contact your WMC for further assistance with administrative and physical controls.

The following are required to satisfy the control requirements of <90 Day Areas:

- Physically control all outdoor < 90 Day Areas
- Post the emergency contacts
  - — It is highly recommended to post the site safety plan

5.12 Postings

SAAs **MUST** have the following postings:

- Sign with the words “Hazardous Waste Satellite Storage Area” or “Hazardous Waste Satellite Accumulation Area”
- SAA contact (SAA custodian)
- SAA site identification number
- Authorized users list
- Radiological postings as determined by DSESH-STO RP, Health Physics Operations, if there is mixed waste

< 90 Day Areas **MUST** have the following postings:

- Sign with the words “Hazardous Waste < 90 Day Storage Area” or “Hazardous Waste <90 Day Accumulation Area”
  - — It is highly recommended to post the < 90 Day Accumulation Area-Emergency and Site Specific Plan
- Radiological postings as determined by DSESH-STO RP if storing a mixed waste

Postings **MUST** remain highly visible at all times. Postings are never to be covered, blocked, or removed without DSESH-STO waste management approval. Contact your WMC for assistance with postings.

5.13 Disposal

To dispose of hazardous waste:

- Ensure that the WPF accurately describes the waste stream
- Assign a cost string to the WPF in WCATS
- Complete the Waste Acceptance Form or the Waste Item Inventory form
- Submit a STO Service Request to the STO waste management organization
  - — Provide all of the information requested on the STO Service Request including the cost account information for charging the disposal, packaging, and transportation costs

5.14 Nonconformance

Noncompliance with the requirements of this document **may** result in <u>not</u> satisfying the WAC for the destination TSDF. The TSDFs conduct Quality Assurance checks and if the waste does <u>not</u> satisfy the applicable WAC requirements, the originator will be issued a Nonconformance Report (NCR).

NCRs are issued for, but <u>not</u> limited to:

- Improperly characterized waste
- Improperly completed or missing forms
- Improperly segregated waste
- Improperly packaged waste
- Improperly labeled waste
- Failure to schedule a waste transfer before it arrives at the TSDF
- Failure to satisfy the WAC requirements

5.14 Nonconformance (cont.)

If a discrepancy with a waste is discovered at a TSDF, the TSDF will either accept the waste after remediation or return the waste to the originator. The originator is responsible for all costs associated with remediation. DSESH-STO waste management will assist the waste generator with the initiated corrective actions, remediation of the waste discrepancy, and response to the nonconformance report within 30 calendar days.

5.15 Forecasts

Waste generators are responsible for providing waste volume projections in a timely manner to each TSDF as requested. The volume projection **MUST** be updated during the year when a significant change in the volume is anticipated. The TSDF requesting the information should provide a questionnaire and allow 30 days for a response.

Contact your WMC for assistance with volume projections.

5.16 Leaks/Spills/Discharges

The STO On-Call Duty Officer at pager 664-4444 or 664-4491 **MUST** be immediately notified of any waste leaks, releases, spills, or unusual or accidental discharges through drains to a wastewater facility or outfall, or any accident or emergency situation. Also, you must contact your Operations Manger immediately during business hours.

All hazardous waste leaks, spills, releases, and discharges **MUST** be cleaned up immediately. The clean-up materials **MUST** be managed as a hazardous waste unless is it a characteristic waste and the characteristic no longer exists. Contact your WMC for assistance.

6.0 INSTRUCTIONS – LOW LEVEL RADIOACTIVE WASTE

This Instruction is a stand-alone sub-section and may be performed independently of, or in conjunction with, other Instruction sub-sections.

6.1 Requirements

All low-level radioactive waste (LLW) **SHALL** be accumulated in compactible LLW collection containers, LLW burial boxes, or in sealable containers within the area where the waste is generated. If a container is not full and sealed for disposal but must be moved from the accumulation area, move it to a Radioactive Waste Staging Area. Once a waste container is full and has been sealed for disposal, the container **MUST** be stored in a Radioactive Waste Staging Area or Radioactive Waste Storage Area. All outer waste containers **SHALL** be properly labeled while collecting or containing LLW. The LANL WAC is constantly changing but following the requirements in this document assist in satisfying the requirements in the WAC. DSESH-STO Waste Management personnel keep up-to-date on WAC requirements and will assist with satisfying the WAC requirements.

STO supports research and development organizations with a wide diversity of research operations and waste streams. It is difficult to provide specific guidance in this document for every possible waste stream. Most LLW generated is radioactive contaminated laboratory trash, equipment, oil, and radioactive material itself.

Notify DSESH-STO waste management personnel of all anticipated waste streams and for assistance with waste determination.

6.2 Waste With No Disposal Path

The only radioactive waste streams with no disposal path at this time are:

- Some non-defense transuranic waste
- Some non-defense mixed transuranic waste

<u>Do not</u> generate these waste streams if possible. Special DOE approval is required before generating these waste streams. If you **MUST** generate one of these waste streams, contact your WMC for assistance.

Problematic Waste is waste that for some other reason cannot be accepted by the intended TSDF within one year of acceptance into storage or will be extremely expensive to ship, treat, and/or dispose.

6.3 Radioactive Waste Management Basis (RWMB)

The RWMB identifies each area where radioactive waste is generated, what types of waste are generated there, what management activities are performed, and the TSDF proposed for final disposition of the waste.

The RWMB includes:

- Generating process owner identification
- Documents supplied to Waste Certification Program (WCP) to support the RWMB
- Waste Authorization Basis documents pertinent to the generating facility
- Types of waste management processes within the facility and their locations
- Waste matrix (solid or liquid)
- Waste categories generated: Low-Level Radioactive Waste (LLW), Mixed Low-Level Radioactive Waste (MLLW), Transuranic (TRU), Mixed Transuranic (MTRU),
- The destination for each waste stream
- The final destination for each waste stream (reported under "Life-Cycle Waste Management")
- The characterization methods for each waste stream
- How waste certification is protected when waste is transported
- How waste certification is protected during waste storage
- How the waste management quality assurance program protects waste certification

Provide the information required for the RWMB every two years and when facility operations or waste status changes. Contact your WMC for assistance with RWMB information submittal.

6.4 Waste Handling Precautions

Individuals using or handling radioactive materials MUST know those materials used in each operation. Compliance with the LANL Radioactive Materials Safety Program requirements for handling the material is required. Take care when handling radioactive waste to prevent contamination. Contact the DSESH-STO IHS representative for assistance.

6.5 Employee Authorizations

Only authorized individuals are allowed to generate LLW in STO-supported facilities. In order to obtain employee authorization:

- Complete the applicable training requirements, at a minimum Waste Generation Overview (WGO) Live training course number 23263 followed by WGO Refresher course number 21464 every three years and be assigned curriculum number 2810, Hazardous Waste Generator, in UTrain
- Obtain Worker Authorization to perform activities which generate LLW from line management

6.6 Operation Authorization

Only authorized operations are allowed to generate LLW in STO-supported facilities. In order to obtain operation authorization:

- Contact an ES&H representative when starting and/or modifying a radioactive material operation, generating or potentially generating <u>any</u> waste in a RCA, or generating LLW outside an RCA
- Assist the ES&H representative in completing all necessary paperwork, including an IWD
- Obtain Work Authorization for the operation from line management

6.7 Waste Minimization

Waste generators are required to make every effort to reduce the amount of LLW generated as much as is technically and economically feasible. Waste can be minimized through:

- Material substitution
- Reducing waste at the source
- Good housekeeping
- Segregating from hazardous materials
- Recycle
- Salvage
- Maximizing the packing efficiency of waste containers (LLW containers **MUST** be at least 90% full.)
- Decontaminating when appropriate
- Unwrapping equipment and supplies outside of the RCA
- Using chemicals which are <u>not</u> regulated as hazardous waste by RCRA whenever possible
- Having operations reviewed by an ES&H representative for minimization opportunities
- Using disposal as the final option

Incorporate waste minimization practices into waste-generating activities and include them in procedures. Have your DSESH-STO WMC review documents (e.g., IWD) to provide waste minimization assistance.

6.8 Green is Clean

NOTE *Suspect radioactive waste **MUST** be stored as radioactive until surveyed and released.*

In a RCA, which has an approved "Green is Clean" designation, determine whether the waste is clean waste, compactable LLW, or noncompactable LLW before or when the waste is generated. If <u>clean waste</u>, then:

- Segregate the clean waste generated by using acceptable knowledge (AK) or survey
- Immediately place the segregated clean waste in the clean waste for disposal container

6.8 Green is Clean (cont.)

The "Green is Clean" containers are located in the Clean Waste Collection Point and are green, have green lids, or clearly designated for clean waste.

Contact the area Radiological Control Technician (RCT) for surveys. Contact your WMC for assistance with "Green is Clean" waste.

6.9 Characterization

There are different types of characterization used in STO-supported facilities. They are:

- Acceptable Knowledge (AK): The IWD or lab notebook for each process serves as the AK documentation. Give the identifying number to your WMC when completing a WPF. If the waste is generated from a non-specific process with no documentation, the WMC will assist with writing the AK in the "Additional Information" section of the WPF. Waste destined for the Nevada National Security Site must have more extensive AK that must be uploaded into the WPF on WCATS.
    - For **"**Green is Clean", enough knowledge of the item's use and history **MUST** be possessed to accurately make a determination of the following requirements:
        - No spill or airborne release has occurred in the area since the most recent radiological survey
        - No direct contact between item and radioactive contamination has occurred
        - No tag or label that indicates radioactive or potentially radioactive contamination
        - Not connected to a contaminated or activated system
        - No potential for activation
        - Not used or located so that contamination is suspected
        - No other reason to suspect the item is contaminated

      If the any of these requirements are true or unknown, assume the item is LLW unless a survey of the item indicates that it is clean.

- Chemical/Physical Analysis: When analysis is required, your WMC submits a "Request for Analysis" and will assist with the WPF when results are received. Your WMC will also request gamma spec analysis or liquid scintillation analysis of waste to assist with the classification of the waste for shipment and disposal.
- Material Safety Data Sheet (MSDS): MSDSs are almost always used because the information provided for contents and characteristics are necessary for completing the WPF and making a waste classification.

Your WMC **MUST** be notified of any changes that affect the characterization of a waste stream. Submit a STO Service Request when analysis of a waste stream is needed and provide all the information requested on the STO Service Request, including the cost account information for cots associated with the analysis.

6.9.1 Waste Profile Form (WPF)

Waste Profile Forms (WPFs) serve as the characterization documentation for each waste stream. The individual completing a WPF **MUST** know the waste stream and anticipate any changes. The individual completing a WPF is responsible for ensuring that:

- The information on the WPF is accurate and best describes the waste stream
- Each waste stream is on a separate WPF

NOTE *Classified waste is <u>not</u> exempt from these requirements and requires a WPF. Do <u>not</u> put classified information in the WPF.*

Each WPF is active for <u>one</u> year. An email will be sent to the WPF owner from WCATS notifying the owner that the WPF **MUST** be reviewed to determine whether the WPF still satisfies the waste stream. If the WPF is still applicable, the owner extends the WPF for a year through the database.

Contact your WMC for assistance in completing or extending a WPF.

6.9.2 Photographic Documentation

Photographing containers greater than 85 gallons in size in layers is highly recommended to verify that the contents satisfy the WAC requirements. The photographs can then be used for the waste container's permanent record. Contact your WMC to discuss the packaging requirements.

6.9.3 Empty Containers

Containers less than or equal to 110 gallons in size are considered RCRA empty (see Section 5, Instructions-Hazardous Waste, for more guidance) if all of the following requirements are satisfied:

- All of the material has been removed that can be removed using the practices commonly employed to remove the material from that type of container (e.g. pouring or pumping)
- No more than one inch of residue remains in a drum <u>or</u> no more than three percent by weight of the total capacity remains in the container
- Aerosol cans **ARE** empty of both the propellant and the liquid, and then punctured

NOTE *Empty nonreturnable compressed gas cylinders (except those that contained a P-listed material) can be disposed of as noncompactible LLW if it is punctured or if the valve is open and has a wire inserted through it.*

Empty containers may be disposed of as LLW. Contact your WMC for assistance in disposing of empty containers.

6.9.4 Orphan Waste

No waste is to be left behind when moving out of a STO-supported facility. STO requires the Workspace Inspection Form 1669 be completed when moving out of a STO-supported facility. Complete the form and contact your WMC at least two weeks in advance of moving out of a STO-supported facility.

When an unknown/orphan radioactive waste is discovered**:**

- Do not open the container
- Do not move the container as it could potentially be shock sensitive
- Have an RCT survey the container for radioactivity
- Immediately contact your WMC who will assist with the handling of the orphan waste in terms of:
  - Storing the waste
  - Physically segregating it from other waste
  - Having it analyzed and surveyed
  - Disposing of the orphan waste
- Meet the requirements of Section 5, Instructions-Hazardous Waste, if the waste is also unknown for hazardous characteristics

The full characterization analysis of orphan waste will cost a minimum of $1,500.

6.9.5 Solidification and Immobilization

LLW **MUST** be in solid form for disposal unless it is approved for discharge to the Radioactive Liquid Waste Treatment Facility (RLWTF). Solid LLW containers **MUST**:

- Have no free liquids
- Have as little residual liquid as reasonably achievable
  - Total residual liquids are not to exceed 1% of the volume of the container
  - Complexing and chelating agents (EDTA, DTPA, citric acid, and acetic acid) **MUST** be less than 1% of the waste form.

6.9.5 Solidification and Immobilization (cont.)

Free liquids that do not satisfy the above requirements and that cannot be discharged to the RLWTF **MUST** be immobilized. Absorbent media approved for NNSS disposal include:

- Speedi Dri, Chemsil 50, Celetom, Chemsil3030, Floor Dry/Superfine, Dicaperl HP200, HiDri, Dicaperl HP500, Safe N Dry, Zonolite Gd4, Florco, Florco X, Petroset, Petroset II, Solid A Sorb, Chemsil 30, Aquaset, Aquaset II, Quicksolid

NOTE *Follow the NNSS approved procedure for immobilization of LLW if the waste is destined for the NNSS.*

Powders **MUST** be packaged in a way they do not present a hazard if the outer container is breached. Powders can be placed in a 30-gallon steel drum then overpacked in 55-gallon steel drum. In a bench top glove bag, some methods to immobilize small amounts of powders are:

- Mixing them in epoxy and allowing the epoxy to cure
- Mixing them in cement and allowing the cement to cure

Contact your WMC for assistance with all LLW liquids.

6.9.6 Compaction

MST-6 has a compactor in Room B100 of the Sigma Building for compacting all of the compactable LLW generated in the Sigma Complex. MST-6 personnel operate the compactor. For compactable LLW generated in the Sigma Complex:

- Place the waste in the plastic bag lined can or box in the RCA
- Seal the bag with tape when full (except bags in B100 of Sigma), and replace the bag
- Request an RCT survey the bag for free release (except bags in B100 of Sigma)
- Transfer the bag to B100 for compaction
- Contact your WMC for assistance with this service

6.9.7 Treatment

NOTE *Uranium chips and turnings are not accepted for burial at TSDFs unless they are treated by solidification or oxidation. LANL ships this waste stream to an off-site TSDF for treatment. See section 6.11.8 for packaging of uranium chips and turnings.*

Appropriate methods and techniques to reduce the volume or provide more stable forms **may** be used to treat LLW. RCRA does allow some treatment such as elementary neutralization or treatability studies but the Water Quality And RCRA

6.9.7 Treatment (cont.)

Group requires documentation prior to such treatment. Contact your WMC for assistance with waste treatment.

Example of LLW treatment:

- Neutralize a hydrochloric acid solution used for radioactive material with sodium hydroxide to produce a more stable form of sodium chloride and water

Examples of illegal waste treatment:

- Leaving solvent wetted wipes in a hood or on the bench top to air dry
- Leaving a container open to allow a hazardous waste to evaporate
- Pouring an unapproved waste into a drain
- Diluting a waste to render it non-hazardous
- Venting a pressurized aerosol can solely to remove the propellant

6.10 Waste Classification

Waste that contains radioactivity and that is not classified as a high-level radioactive waste, transuranic waste, or spent nuclear fuel is a LLW. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, is classified as LLW when the concentration of transuranics is less than 100 nanocuries per gram of waste.

There are no operations within STO-supported facilities that routinely generate TRU waste. DSESH-STO waste management is to be contacted before generating any TRU waste. Your WMC will assist with the storage, packaging, and disposal of the TRU waste in accordance with LANL requirements and WAC. A STO owned TRU waste program will not be developed until TRU waste is routinely generated.

6.10.1 Depleted Uranium Waste

Depleted uranium waste is always a LLW. Report the radionuclide to DSESH-STO waste management and on forms as U(DEP). Depleted uranium is in equilibrium with its daughter products and concentrations are known.

6.10.2 Tritium Waste

Tritium waste is classified in four package concentration levels:

- Low Activity – less than or equal to 20 milliCuries per cubic meter
  - No special packaging requirements (general requirements in this document for LLW apply)
  - **MUST** satisfy DOT requirements for shipping
- Low Activity – greater than 20 milliCuries and less than or equal to 40 Curies per cubic meter
  - Special requirements apply as indicated in other sections of this document
- Moderate Activity – greater than 40 Curies per cubic meter and less than 500 Curies per package
  - Special requirements apply and are not addressed in this document
- High Activity – greater than 500 Curies per package and less than 100,000 Curies per package
  - Special requirements apply and are not addressed in this document

Most tritium operations in STO-supported facilities generate low-activity tritium contaminated waste for which all the special requirements are addressed in this document. It is important to know the activity level of tritium waste that is to possibly be generated. Contact your WMC for further assistance with tritium waste.

6.10.3 Radioactive Sources

Radioactive sources have a known beginning activity of radioactive material. Depending on the age of a source, the daughter products could result in the source being a TRU waste. For the disposal of a radioactive source, contact your WMC for assistance.

6.10.4 Naturally Occurring Radioactive Material (NORM)

10 CFR and 40 CFR do not regulate wastes that contain NORM as a radioactive waste provided that it hasn't been concentrated. Nonradioactive waste can be released to an appropriate facility that is not licensed to accept radioactive material, such as a hazardous waste landfill.

For material containing NORM, where no radioactive material has been added to the original material and the original material has not been concentrated, contact your WMC for assistance with disposing of the material as nonradioactive waste.

6.10.5 Other Radionuclide Waste

The radionuclides to be used in an operation **MUST** be identified. For assistance with the WAC limits and requirements of radionuclides other than U(DEP), contact your WMC.

6.10.6 Fissile Radionuclides

Normally there are minimal fissile radionuclides used in STO-supported facilities. Contact your WMC if a waste generator **MUST** use fissile radionuclides to verify the requirements in the WAC. There are limits for fissile gram equivalents to protect from criticality and heat generation through radiolysis.

6.10.7 Scintillation Cocktails

Ultima gold is a nonhazardous aqueous/organic solution therefore is not a mixed waste when contaminated with radioactive material. Immobilize these waste solutions using an approved method for Nevada National Security Site (NNSS) disposal (also see section 6.9.5). Request a RCT provide the tritium contamination level for the absorbed material so that the level can be calculated for the disposal request. Gamma spec analyze the container of waste for other radionuclides. The empty containers can then be disposed of in a compactable LLW container.

6.10.8 LLW With Beryllium and/or Carbon

Processed beryllium is <u>not</u> a RCRA hazardous waste therefore it is <u>not</u> a mixed waste when containing a radioactive component. LLW with beryllium is acceptable for burial at TSDFs. This waste **MUST** be double bagged or double wrapped in plastic and packaged in approved DOT containers. The waste must not have beryllium and/or carbon totaling greater than 20% by weight in the waste matrix. Contact your WMC for further assistance.

6.11 Staging, Storage, and Accumulation

NOTE *Hazardous Waste is <u>not</u> to be placed in Radioactive Waste Staging or Storage Areas. Mixed waste **MUST** be accumulated in a Hazardous Waste Satellite Accumulation Area (SAA) or a Hazardous Waste <90 Day Storage Area (<90 Day Area), which **MUST** also be posted as a RCA if required.*

All LLW **SHALL** be accumulated in compactible LLW collection containers, LLW burial boxes, or in sealable containers within the area where the waste is generated. If a container is not full and sealed for disposal but must be moved from the accumulation area, move it to a Radioactive Waste Staging Area. LLW in closed containers that are not sealed for shipment **SHALL** be in compactable LLW collection containers, LLW burial boxes, or in sealable containers in a LLW Radioactive Waste Staging Area. LLW in closed containers that are sealed for shipment **SHALL** be in compactable LLW collection containers, LLW burial boxes, or in sealed containers in a Radioactive Waste Staging Area or Radioactive Waste Storage Area. LLW waste accumulated at generation sites does not require accumulation in a Staging or Storage Area. For LLW accumulated in a room without an RCA, keep LLW containers away from clean waste

6.11 Staging, Storage, and Accumulation (cont.)

containers at all times. Contact your WMC for LLW staging, storage, and accumulation assistance.

LLW in closed containers that are sealed for shipment **MUST** be marked with the closed date and placed in a Radioactive Waste Staging Area or Radioactive Waste Storage Area. LLW must be disposed from these areas within a specific timeframe:

- 90 days for a Staging Area
- One year for a Storage Area

6.11.1 Segregation

Waste streams **MUST** be segregated to meet the LANL WAC:

- Liquids and solids in separate containers
- Hazardous and radioactive wastes are to be kept separate
  - Do <u>not</u> take hazardous materials into RCAs unless absolutely necessary
- Chemical and radioactive waste in accordance with the waste profile:
  - Asbestos
  - PCB waste
  - Beryllium
  - Explosives
  - Pyrophorics
  - Infectious/medical/biological waste

Contact your WMC for further guidance on segregation.

6.11.2 Compactable LLW

Compactable LLW is material capable of undergoing a volume reduction (e.g., paper, plastic, cardboard, cloth, small wood splints, rubber, or glass). A small amount of noncompactable waste (except empty aerosol cans) is allowed in a container of compactable waste. Place compactable LLW in following containers:

- Yellow metal container provided with a plastic bag
- Labeled 1’ x 1’ x 2’ cardboard box with a plastic bag
- Labeled steel drum

LLW for compaction **MUST** <u>not</u> contain:

- Beryllium
- Irradiation sources
- Absorbed liquids
- Immobilized powders
- Aerosol cans
- Gas cylinders
- Tritium greater than 20 milliCuries per cubic meter

NOTE *Tritium LLW greater than 20 milliCuries but less than 40 Curies per cubic meter **MUST** be packaged in steel drums or steel LLW burial boxes. LLW with beryllium **MUST** be double bagged or double wrapped in plastic and placed in steel drums or steel LLW burial boxes.*

6.11.3 Noncompactable LLW

Noncompactable LLW is material not capable of being compacted or of undergoing volume reduction (e.g., metal materials with minimum void space, dense materials, and metal bricks). Place noncompactable LLW in the following containers:

- Labeled 1' x 1' x 2' cardboard box lined with a plastic bag
- Labeled steel drum
- Labeled metal LLW burial box

NOTE *High efficiency particulate air (HEPA) filters and empty aerosol cans are noncompactable waste.*

6.11.4 Compatibility

LLW streams **MUST** be compatible with the:

- Container
- Spill containment (for liquids)
- Other waste in the same spill containment

Contact your WMC or DSESH-STO IHS representative for further guidance on compatibility.

6.11.5 Containers

LLW containers **MUST** satisfy the following criteria:

- In good condition (outer packaging containers) with no structural defects that could impair the integrity of the container such as:
  - Holes
  - Rusting
  - Dents
  - Bulges
- Sufficient thickness that any deformation is within the design parameters; outer packaging containers are purchased to satisfy this requirement
- Filled to minimize the void space (10% or less)

Replace deteriorated or damaged containers immediately. Contact your WMC for assistance with the purchase of the proper containers for the waste being generated.

6.11.6 Weight Limits

The gross weight limits for packaged LLW are:

- 35 pounds for LLW plastic-lined cardboard boxes
- 850 pounds for steel drums
- 10,000 pounds for LLW burial boxes (unless otherwise marked)
- Rated capacity of other types of containers

Verify the rated capacity of all containers whether or not they are listed here. A means to off-load LLW at the LANL TSDF **MUST** be provided for individual packages exceeding 30,000 pounds.

6.11.7 Special Packaging

LLW containing respirable size particulates (e.g., powders or ashes) **MUST** be packaged in a way it will not be a hazard if the container is breached. LLW with respirable particulates such as:

- Powders **MUST** be packaged in a strong inner container and overpacked in a steel drum
- HEPA filters **MUST** be double bagged and placed in the original box of the new filter and overpacked

LLW containing gases **MUST** be packaged at a pressure not exceeding 1.5 atmospheres.

Contact your WMC for further assistance with packaging.

6.11.8 Depleted Uranium Machined Chips And Turnings

U(DEP) machined chips and turnings are pyrophoric and **MUST** be packaged in a way that it will not be a hazard if the outer container is breached. U(DEP) chips and turnings **MUST**:

- Be accumulated and packaged in mineral oil in a metal inner container
- Have an activated charcoal filter (e.g. NucFil filter) on the lid of the inner container to allow generated gases to vent
- Be overpacked in a steel drum with the void space filled with an absorbent material such as vermiculite
- Have an activated charcoal filter (e.g. NucFil filter) on the lid of the outer container to allow generated gases to vent
- NOT be compacted by mechanical or other means

Contact your WMC for further assistance with packaging.

6.12 Labeling

Label each outer container holding LLW with:

- Low-Level Radioactive Waste label or clearly marked:
  - — Waste Profile Form (WPF) or Waste Stream Identification (WSID) number
  - — Location where waste is generated
  - — Waste generator’s name
  - — Waste generator’s group
  - — Major radionuclides
  - — Package contents
  - — Date sealed
  - — Weight (when sealed)
  - — NRC class
- “Caution Radioactive Material – Radioactive Waste” or “Caution Radioactive Waste”
- For waste contaminated with tritium “Caution Radioactive Material – Tritium Contamination”
- For waste contaminated with beryllium “Danger Contaminated With/Contains Beryllium”

Ensure that all written information is legible. If necessary, cover the label with clear packing tape to protect the ink.

For a mixed waste the requirements of Section 5, Instructions-Hazardous Waste **MUST** also be satisfied.

DSESH-STO waste management supplies the appropriate labels for LLW. Appendix 4, Radioactive Waste Label, illustrates a label supplied by DSESH-STO waste management for LLW. Contact your WMC for assistance with labels.

6.13 Controls

STO uses administrative controls at Clean Waste Collection Points. They are partially maintained by DSESH-STO waste management. To satisfy the administrative control requirements in a Clean Waste Collection Point, the following requirements **MUST** be satisfied:

- Keep postings highly visible
- Use AK or surveys to determine whether the waste is clean
- Keep radioactive materials and contamination away from the containers

Contact your WMC for further assistance with administrative controls.

6.14 Postings

Radioactive Waste Staging Areas **MUST** be posted with a sign with the words "Caution Radioactive Waste – Waste Staging Area."

Radioactive Waste Storage Areas **MUST** be posted with a sign with the words "Caution Radioactive Waste – Waste Storage Area."

Clean Waste Collection Points do not have posting requirements but it is highly recommended to clearly post the area to help prevent contamination of clean waste:

- Sign with the words "Clean Waste Collection Point"
- A list of approved operations in the area

Ensure the postings for storage areas or collection points remain highly visible at all times. Never cover, block, or remove the postings without DSESH-STO waste management approval. Contact your WMC for assistance with postings.

6.15 LLW Disposal

To dispose of radioactive waste:

- Ensure that the WPF accurately describes the waste stream
- Assign a cost string to the WPF in WCATS
- Complete the Waste Acceptance Form or the Waste Item Inventory form
- Submit a STO Service Request to the STO waste management organization; provide all of the information requested on the STO Service Request including the cost account information for charging the disposal, packaging, and transportation costs

6.16 Nonconformance

Noncompliance with the requirements of this document **may** result in not satisfying the WAC for the destination TSDF. The TSDFs conduct Quality Assurance checks and if the waste does not satisfy the applicable WAC requirements, the originator will be issued a Nonconformance Report (NCR). NCRs are issued for, but not limited to:

- Improperly characterized waste
- Improperly completed or missing forms
- Improperly segregated waste
- Improperly packaged waste
- Improperly labeled waste
- Failure to schedule a waste transfer before it arrives at the TSDF
- Failure to satisfy the WAC requirements

If a discrepancy with a waste is discovered at a TSDF, the TSDF will either accept the waste after remediation or return the waste to the originator. The originator is responsible for all costs associated with remediation. DSESH-STO waste management will assist the waste generator with the initiated corrective actions, remediation of the waste discrepancy, and response to the nonconformance report within 30 calendar days.

6.17 Forecasts

Waste generators are responsible for providing waste volume projections in a timely manner to each TSDF as requested. The volume projection **MUST** be updated during the year when a significant change in the volume is anticipated. The TSDF requesting the information should provide a questionnaire and allow 30 days for a response.

Contact your WMC for assistance with volume projections.

6.18 Leaks/Spills/Discharges

The STO On-Call Duty Officer at pager 664-4444 or 664-4491 **MUST** be immediately notified of any waste leaks, releases, spills, or unusual or accidental discharges through drains to a wastewater facility or outfall, or any accident or emergency situation. Also, you must contact your Operations Manager immediately during business hours.

All LLW leaks, spills, releases, and discharges **MUST** be cleaned up immediately. The clean-up materials **MUST** be managed as the same type of LLW generated from the radioactive material involved. Contact your WMC for assistance.

7. INSTRUCTIONS—UNIVERSAL WASTE

This Instruction is a stand-alone sub-section and **may** be performed independently of, or in conjunction with, other Instruction sub-sections.

7.1 Requirements

NOTE *Failure to comply with all requirements in this document could result in serious disciplinary action.*

All Universal Waste (UW) **SHALL** be accumulated in a Universal Waste Area (UWA), properly labeled, and in closed containers. The LANL WAC is constantly changing but following the requirements in this document will assist in satisfying the requirements in the WAC. DSESH-STO Waste Management personnel keep up-to-date with WAC requirements, and will assist in complying with these requirements.

STO supports Research and Development Organizations with a wide diversity of research operations and waste streams. It is difficult to provide specific guidance in this document for every possible waste stream. Most Universal Wastes generated are lamps, bulbs, batteries, aerosol cans, and mercury ampules.

7.2 Waste Handling Precautions

Use care to ensure the integrity of fluorescent lamps and mercury ampules is not compromised. Breakage of the glass will result in a mercury spill and must be cleaned up immediately.

7.3 Generator Authorization

The Universal Waste requirements in 40 CFR are a sub-set of the hazardous waste requirements promulgated to provide regulatory relief for commonly generated hazardous waste. Therefore there are no authorization requirements for personnel who generate Universal Waste.

7.4 Waste Minimization

Waste generators are required to make every effort to reduce the amount of UW generated as much as is technically and economically feasible. Use disposal as the final option. UW can be minimized through the following methods:

- Material substitution
- Good housekeeping
- Recycle
- Reuse of good items

7.5 Hazardous Waste Determination

Each waste stream **MUST** be classified before or at the time of waste generation in order to properly manage and dispose of the waste. If UW is contaminated with chemicals (e.g., beryllium) that does not allow it to be recycled, then it **MUST** be managed and disposed of as a Hazardous Waste. Your WMC can be contacted to obtain a waste classification and for assistance with completing a Waste Profile Form (WPF).

IF a material is determined to satisfy one of the following criteria:

- Cannot be reused
- Cannot be used for its intended purpose
- Has exceeded its shelf life
- Has no known owner or generator
- Is no longer wanted or needed

THEN the material is **WASTE**.

7.6 Universal Waste

The Universal Waste requirements in 40 CFR are a sub-set of the hazardous waste requirements promulgated to provide regulatory relief for hazardous waste commonly generated throughout facilities. The UW requirements apply to fluorescent lamps, incandescent bulbs, all batteries except alkaline and carbon, unused/unspent pesticides, mercury containing ampules and equipment, and aerosol cans.

7.6.1 Lamp

The bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infrared regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to fluorescent, high-intensity discharge, neon, mercury-vapor, high-pressure sodium, metal-halide, and incandescent.

Fluorescent lamps contain 10 to 40 milligrams of mercury and incandescent bulbs have a lead solder joint and a lead contact point. These types of lamps **MUST** be managed as Universal Waste.

7.6.2 Battery

A device consisting of one or more electrically connected electrochemical cells that is designed to receive, store, and deliver electrical energy. An electrochemical cell is a system consisting on an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.

Batteries often contain toxic metals and electrolytes that are regulated as hazardous waste therefore must be managed as Universal Waste. Examples of common UW batteries are silver oxide, nickel cadmium, lithium ion, mercury, and nickel metal hydride.

Alkaline and carbon batteries are **not** hazardous waste and can be thrown in the trash.

Wet lead acid and gel cell batteries **may** be managed for recycle and sent to LANL Salvage.

7.6.3 Pesticide

Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant. Pesticides must be recalled or unused/unspent to be regulated as a Universal Waste.

7.6.4 Mercury

Mercury-Containing Equipment (MCE) includes devices, items, or articles that are hazardous waste due to the presence of elemental mercury. The mercury must be “integral” to the function of the equipment. Integral means that the mercury must be part of the function of the device. Some commonly recognized MCE are thermostats, barometers, manometers, flow meters, thermometers, pressure gauges, relays, and switches.

There is no requirement to remove ampules from equipment but doing so reduces the amount of waste that must be managed and disposed of as Universal Waste.

7.6.5 Aerosol Can

A container in which gas under pressure is used to aerate and dispense any material through a valve in the form of a spray or foam. Aerosol cans that are classified as hazardous waste should be managed as Universal Waste. Such cans will contain propellant, liquid, or both.

Aerosol cans usually contain ignitable propellants and solvents. Some paints may contain toxic metals such as lead and cadmium. Examples of common UW aerosol cans are WD-40, spray paint, spray lubricant, air deodorizers, 3M adhesive, and dust chaser.

7.7 Characterization

Due to the Universal Waste definitions and requirements that must be met in order to be classified as UW, there is not much need for characterization. The most common type of characterization used in STO for UW is:

- <u>Material Safety Data Sheet (MSDS)</u>: MSDSs are almost always used because of the information provided for contents and characteristics are necessary for completing the disposal request form.

7.7.1 Waste Profile Form (WPF)

LANL-wide WPFs for UW are in place to be used for disposal. A WPF must be generated if the waste cannot be classified as UW therefore requiring the waste generator to meet the hazardous waste requirements. The WPF serves as the characterization documentation for a waste stream. The individual completing a WPF is responsible for ensuring that:

- The information on the WPF is accurate and best describes the waste stream
- Each waste stream is on a separate WPF

If the waste cannot be managed and disposed of as Universal Waste, use Section 5, Instructions – Hazardous Waste, of this document as it must be managed as hazardous or mixed waste.

7.7.2 Empty Containers

Aerosol cans **MUST** be empty of both the propellant and the liquid to be classified as nonhazardous waste. STO allows WMCs to use a proper puncturing device for empty dust chaser and compressed air cans. STO requires all other empty aerosol cans be managed as Universal Waste. **DO NOT PUNCTURE** any aerosol cans and contact your WMC for assistance in proper disposal.

7.8 Storage

All UW **MUST** be stored in a Universal Waste Area (UWA). Always keep the UWA free of obstacles or deterioration that could cause a spill, accident, or prevent access by emergency personnel and equipment.

7.8.1 Segregation

Universal waste streams **SHALL** be segregated. Keep:

- waste types in separate containers
- fluorescent and mercury-vapor lamps in separate containers from high-intensity discharge, neon, high-pressure sodium, metal-halide, and incandescent lamps

Batteries can be accumulated together in a single container but must be segregated for submitting the disposal request form.

7.8.2 Compatibility

Universal Waste streams **MUST** be compatible with the:

- Container
- Spill containment
- Other waste in the same spill containment

7.8.3 Containers

NOTE *EPA explained that the purpose of the closed container requirement is "to minimize emissions of volatile wastes, to help protect ignitable or reactive wastes from sources of ignition or reaction, to help prevent spills, and to reduce the potential for mixing of incompatible wastes and direct contact of facility personnel with waste."*

Universal Waste containers **MUST** be:

- Sealed/closed to the EPA's intent
  - — the only time a universal waste container can be open is when waste is actively being put into the waste container
  - — boxes used for fluorescent lamps **MUST** have no holes that glass shards could be released through
- In good condition
  - — replace deteriorated or damaged containers immediately
- Compatible with the waste
  - — use containers suitable for the type of waste

Package MCE in a manner to prevent breakage of glass ampules.

Examples of noncompliant open containers are:

- Handle hole on a lamp box open
- Zip lock bags not completely sealed
- Lid completely off the container
- Leaking battery not in a closed container

7.8.4 Universal Waste Area (UWA)

UWAs are limited by time, not by volume. Waste placed in UWAs **MUST** be characterized and transferred to a TSDF or recycling facility within one year. The one year period starts once waste accumulation begins in a container but a disposal request must be submitted by the end of six months. If waste is added to that same container at a later date, do not change the date.

In a UWA, each container **MUST** be:

- Closed
- Labeled or clearly marked with the words “Universal Waste”
- Marked with the accumulation start date

7.9 Labeling

Each outer container holding UW **MUST** satisfy the following:

- Be labeled or clearly marked with the words “Universal Waste”
- List the contents
- Be clearly marked with the accumulation start date

Use pens or markers to write on labels with ink resistant to fading and smudging. If any other ink is used, cover it with clear packing tape in order to protect the ink. Ensure that all written information is legible.

7.10 Postings

UWAs **MUST** have the following postings:

- Sign with the words “Universal Waste Area”
- UWA contact (UWA custodian)
- UWA site identification number

Postings **MUST** remain highly visible at all times. Postings are never to be covered, blocked, or removed without DSESH-STO waste management approval. Contact your WMC for assistance with postings.

7.11 UW Disposal

To dispose of UW:

- Ensure that the LANL wide WPF accurately describes the waste stream
- Complete the Waste Acceptance Form or the Waste Item Inventory form
- Submit a STO Service Request online for your DSESH-STO WMC.

Provide all of the information requested on the STO Service Request including the cost account information for charging the disposal, packaging, and transportation costs.

7.12 Nonconformance

Noncompliance with the requirements of this document **may** result in not satisfying the LANL WAC for the destination TSDF or recycling facility. The TSDFs conduct Quality Assurance checks and if the waste does not satisfy the applicable WAC requirements, the originator will be issued a Nonconformance Report (NCR).

NCRs are issued for, but not limited to, the following:

- Improperly characterized waste
- Improperly completed or missing forms
- Improperly segregated waste
- Improperly packaged waste
- Improperly labeled waste
- Failure to schedule a waste transfer before it arrives at the TSDF
- Failure to satisfy the WAC requirements

Waste that is discovered at the TSDF to have discrepancies is either accepted after remediation or returned. The waste generator is responsible for all costs associated with remediation. DSESH-STO waste management will assist the waste generator with the initiated corrective actions, remediation of the waste discrepancy, and response to the nonconformance report within 30 calendar days.

7.13 Forecasts

Waste generators are responsible for providing waste volume projections in a timely manner to each TSDF as requested. The volume projection **MUST** be updated during the year when a significant change in the volume is anticipated. The TSDF requesting the information should provide a questionnaire and allow 30 days for a response. Universal Waste is reported to the requesting official as chemical waste.

Contact your WMC for assistance with volume projections.

7.14 Leaks/Spills/Discharges

The STO On-Call Duty Officer at pager 664-4444 or 664-4491 **MUST** be immediately notified of any waste leaks, releases, spills, or unusual or accidental discharges through drains to a wastewater facility or outfall, or any accident or emergency situation. Also, you must contact your Operations Manger immediately during business hours.

All UW leaks, spills, releases, and discharges **MUST** be cleaned up immediately. The clean-up materials **MUST** be managed as a **hazardous waste** in most cases. Contact your WMC for assistance.

8.0 INSTRUCTIONS—BIOLAGICAL WASTE

This Instruction is a stand-alone sub-section and **may** be performed independently of, or in conjunction with, other Instruction sub-sections.

8.1 Requirements

NOTE *Failure to comply with all requirements in this document could result in serious disciplinary action.*

Biological waste that is classified as Regulated Infectious Waste and not treated on-site **SHALL** be accumulated in a Special Waste Area (SWA) properly labeled and in closed containers. The LANL WAC is constantly changing but following the requirements in this document will assist in satisfying the requirements in the WAC. DSESH-STO Waste Management personnel keep up-to-date with WAC requirements, and will assist in complying with these requirements.

Biological Division (B Division) has requirements for biological waste management in B-DOC-100 titled Biosafety User's Manual that are not addressed in this instruction. B Division personnel are required to follow the added division requirements in B division operations.

STO supports Research and Development Organizations with a wide diversity of research operations and waste streams. It is difficult to provide specific guidance in this document for every possible waste stream. Most biological wastes in STO-supported facilities are treated on-site using an approved autoclave method.

8.2 Waste Handling Precautions

Individuals using or handling chemicals and biological agents **MUST** know those materials used in each operation and the products of any reactions. Use care to ensure the integrity of waste containers is not compromised. Use proper PPE for the level of biological waste being handled.

8.3 Generator Authorization

There are no regulatory authorization requirements for personnel who generate biological waste but the waste generator **MUST** complete Waste Generation Overview training to own Waste Profile Forms (WPF). Personnel handling biological materials are Authorized Workers through the LANL Integrated Management System for their IWDs therefore are authorized to generate biological waste.

8.4 Waste Minimization

Waste generators are required to make every effort to reduce the amount of biological waste generated as much as is technically and economically feasible. Biological waste can be minimized through the following methods:

- Material substitution
- Good housekeeping
- Disinfection, decontamination, sterilization

8.5 Hazardous Waste Determination

Each waste stream **MUST** be classified before or at the time of generation in order to ensure that the waste is managed and disposed of properly. Biological waste that is contaminated with or contains a material that is classified as a hazardous waste must be managed and disposed of as hazardous waste. Your WMC can be contacted to obtain a waste classification and for assistance with completing a WPF.

IF a material is determined to satisfy one of the following criteria:

- Cannot be reused
- Cannot be used for its intended purpose
- Has exceeded its shelf life
- Has no known owner or generator
- Is no longer wanted or needed
- Is an end product of a process or experiment that cannot be used as feedstock in an existing process

THEN the material is **WASTE**.

8.6 Autoclave (Wet Heat)

Decontamination of cultures and items contaminated by biohazardous agents is a vital step toward protection of workers from infectious disease and prevents release of such agents into the community. Sterilization of media and equipment is a critical component of standard quality control.

All solid biological waste generated in a BSL-2 laboratory **must** be decontaminated before leaving the laboratory, or must be monitored by the generator until autoclaved. BSL-1 waste generated in a BSL-2 laboratory is not required to be autoclaved before leaving the laboratory.

You **must** meet the autoclave requirements in chapter 16 of OST 402-530-00 titled Biosafety Manual to ensure your waste has been effectively sterilized for Municipal Refuse (regular trash) disposal.

8.6 Autoclave (Wet Heat) (continued)

Autoclave requirements include:

- For BSL-1 waste, the autoclave may be on the same floor
- For BSL-2 waste, the laboratory shall either have an autoclave within the laboratory, or the waste shall be placed in a durable, leakproof container and closed for transport from the laboratory
- For BSL-3 waste, the autoclave shall be located within the laboratory
- Complete the autoclave log for each autoclave cycle
- Use a chemical indicator (e.g. autoclave tape) with each load
- Monitor sterility at least every 40 hours of autoclave operation using appropriate biological indicators (Bacillus stearothermophilus spore strips) placed at locations throughout the autoclave
- Re-autoclave if the autoclave does not attain the minimum time and/or temperature or the autoclave tape does not change color
- FAX form 4002-530-00-16.2 "Noninfectious Waste Transfer" to Los Alamos County Solid Waste Division at least annually or upon any change affecting the sterilization process for autoclaved waste

Caution: Dry hypochlorites, or any other strong oxidizing material, shall not be autoclaved with organic materials such as paper, cloth or oil as a violent reaction may occur.

8.7 Biological Waste

Waste that contains or is a Biohazardous Material which includes a biohazardous agent (bacteria, chlamydia, fungi, parasites, prions, rickettsias, and viruses); recombinant DNA; human or primate tissues, fluids, cells, or cell culture; biological select agents and toxins; transgenic plants or animals; human gene therapy; animals known to be reservoirs of zoonotic diseases, and toxins and allergens of biological origin.

8.7.1 Regulated Infectious Waste

New Mexico Special Waste (NMSW) Infectious Waste is a solid waste (not a hazardous, radioactive, or regulated PCB waste) that carries a probable risk of transmitting disease to humans or animals. The definition is complex and includes wastes such as:

- cultures and stocks of infectious agents and associated biologicals
- human pathological wastes, including tissues, organs, and body parts, but not including hair, or nails
- human and body fluid waste (except body excretions such as feces and secretions such as nasal discharges, saliva, sputum, sweat, tears, urine, and vomitus unless visibly contaminated with blood or other regulated waste from a person or animal)

8.7.1 Regulated Infectious Waste (continued)

- contaminated animal carcasses, body parts, blood, blood products, secretions, excretions, and bedding of animals that were known to have been exposed to zoonotic infectious agents or non-zoonotic human pathogens, including during research
- biological wastes and waste contaminated with bloody excretions, exudates, or secretions
- discarded sharps, used or unused (unless in original packaging), generated at a facility, that have, or are likely to have, come in contact with infectious agents while involved in human or animal patient care, treatment, or research, including hypodermic needles, syringes (with the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, culture dishes, suture needles, slides, cover slips, and other broken or unbroken glass or plasticware, unless properly treated or otherwise specifically exempted

8.7.2 BSL-1

A level that includes bioagents that are not known to cause disease in healthy adults.

8.7.3 BSL-2

A level that includes bioagents associated with human disease and hazards from autoinoculation, ingestion, and mucous membrane exposures.

8.7.4 BSL-3

A level that includes indigenous or exotic bioagents communicated through aerosols and that produce diseases with serious or lethal consequences.

8.8 Characterization

Due to the biological waste definitions and requirements that must be met in order to be classified as biological waste, there is not much need for characterization. The most common types of characterization used in STO for biological waste are:

- Acceptable Knowledge (AK): The Integrated Work Document (IWD) or lab notebook for each process serves as the AK documentation. Give the identifying number to your WMC when completing a WPF. If the waste is generated from a non-specific process with no documentation, the WMC will assist in writing the AK in the “Additional Information” section of the WPF.
- Material Safety Data Sheet (MSDS): MSDSs are almost always used because of the information provided for contents and characteristics are necessary for completing the disposal request form.

8.8.1 Waste Profile Form (WPF)

The WPF serves as the characterization documentation for a waste stream. The individual completing a WPF is responsible for ensuring that:

- The information on the WPF is accurate and best describes the waste stream
- Each waste stream is on a separate WPF

Each WPF is active for one year. An email will be sent to the WPF owner from WCATS notifying the owner that the WPF **MUST** be reviewed to determine whether the WPF still satisfies the waste stream. If the WPF is still applicable, the owner extends the WPF for a year through the database.

If the waste cannot be managed and disposed of as Municipal Refuse or New Mexico Special Waste, use Section 5, Instructions – Hazardous Waste, of this document as it must be managed as hazardous or mixed waste.

8.8.2 Empty Containers

Containers that contained a Biohazardous Material **must** be autoclaved even when empty. Package the empty container with waste to be autoclaved.

8.9 Storage

Biological waste that is classified as Regulated Infectious Waste and not treated on-site **SHALL** be accumulated in a Special Waste Area (SWA), properly labeled, and in closed containers. Contact your WMC for further guidance.

8.9.1 Segregation

Waste streams **SHALL** be segregated. Keep:

- liquids and solids in separate containers
- biological, hazardous, and non-hazardous waste in separate containers

Biological waste **MUST** be physically segregated (e.g., separate spill trays or cabinets) from the following while in storage:

- Non-hazardous waste
- Incompatible waste
- Mixed waste
- Radioactive waste
- Product chemicals

8.9.2 Compatibility

Biological waste streams **MUST** be compatible with the:

- Container
- Spill containment
- Other waste in the same spill containment

8.9.3 Containers

NOTE *EPA explained that the purpose of the closed container requirement is "to minimize emissions of volatile wastes, to help protect ignitable or reactive wastes from sources of ignition or reaction, to help prevent spills, and to reduce the potential for mixing of incompatible wastes and direct contact of facility personnel with waste."*

Regulated infectious waste containers **MUST** be:

- Sealed/closed to the EPA's intent
- In good condition
  - — constructed to prevent leaks
  - — replace deteriorated or damaged containers immediately
- Compatible with the waste
  - — use containers suitable for the type of waste
- Labeled
  - — with a biohazard label
  - — as "New Mexico Special Waste"

Biological waste for autoclave **MUST** be:

- Sealed/closed in a manner suitable for the autoclave
- In good condition
  - — constructed to prevent leaks
  - — replace deteriorated or damaged containers immediately
- Compatible with the waste
  - — use containers suitable for the type of waste
- Approved for autoclave
  - — use autoclave bags that avoid melting, leaking, or the release of toxic gases

8.9.4 Special Waste Area (SWA)

SWAs are limited by time, <u>not</u> by volume. Waste placed in SWAs **MUST** be characterized and transferred to a disposal facility within 90 days <u>after</u> the date the container is filled and ready for transport. The 90 day period starts once the container is sealed but a disposal request must be submitted by the end of 30 days.

In a SWA, each container **MUST** be:

- Tightly closed
- Labeled or clearly marked with the words "New Mexico Special Waste"
- Marked with the accumulation start date
- Marked with a list of container contents and their hazards (e.g., inhalation, ingestion, dermal)
- Marked with the generator's name and address

8.10 Labeling

Each outer container holding Regulated Infectious Waste **MUST** satisfy the following:

- Bags must be labeled with the words **Biohazard, Biological Hazard** or have the **Biohazard Symbol**
- Rigid containers must be labeled **Biomedical Waste** or **Infectious Waste** or they may be labeled in the same manner as bags
- List the contents
- Be clearly marked with the accumulation start date

Best Management Practice: Biohazard bags and sharps containers for autoclave should be labeled or marked with the Group name, building number, and room number. All containers at LANL must be labeled with at a minimum, it's contents to avoid a RCRA violation as an abandoned waste.

Use pens or markers to write on labels with ink resistant to fading and smudging. If any other ink is used, cover it with clear packing tape in order to protect the ink. Ensure that all written information is legible.

8.11 Postings

SWAs **MUST** have the following postings:

- Sign with the words "Special Waste Area"
- SWA contact (SWA custodian)
- SWA site identification number

Postings **MUST** remain highly visible at all times. Postings are never to be covered, blocked, or removed without DSESH-STO waste management approval. Contact your WMC for assistance with postings.

8.12 Disposal

After autoclave bags have cooled sufficiently to handle, they shall be disposed in a solid waste container. The waste generator disposes of autoclaved waste.

To dispose of Regulated Infectious Waste:

- Ensure that the WPF accurately describes the waste stream
- Complete the Waste Acceptance Form or the Waste Item Inventory form
- Submit a STO Service Request online for your STO WMC. Provide all of the information requested on the STO Service Request including the cost account information for charging the disposal, packaging, and transportation costs.

8.13 Nonconformance

Noncompliance with the requirements of this document **may** result in not satisfying the LANL WAC for the destination TSDF or recycling facility. The TSDFs conduct Quality Assurance checks and if the waste does not satisfy the applicable WAC requirements, the originator will be issued a Nonconformance Report (NCR).

NCRs are issued for, but not limited to, the following:

- Improperly characterized waste
- Improperly completed or missing forms
- Improperly segregated waste
- Improperly packaged waste
- Improperly labeled waste
- Failure to schedule a waste transfer before it arrives at the TSDF
- Failure to satisfy the WAC requirements

Waste that is discovered at the TSDF to have discrepancies is either accepted after remediation or returned. The originator is responsible for all costs associated with remediation. DSESH-STO waste management will assist the waste generator with the initiated corrective actions, remediation of the waste discrepancy, and response to the nonconformance report within 30 calendar days.

8.14 Forecasts

Waste generators are responsible for providing waste volume projections in a timely manner to each TSDF as requested. The volume projection **MUST** be updated during the year when a significant change in the volume is anticipated. The TSDF requesting the information should provide a questionnaire and allow 30 days for a response. Regulated Infectious Waste is reported to the requesting official as chemical waste.

Contact your WMC for assistance with volume projections.

8.15 Leaks/Spills/Discharges

The STO On-Call Duty Officer at pager 664-4444 or 664-4491 **MUST** be immediately notified of any waste leaks, releases, spills, or unusual or accidental discharges through drains to a wastewater facility or outfall, or any accident or emergency situation. Also, you must contact your Operations Manager immediately during business hours.

All biological waste leaks, spills, releases, and discharges **MUST** be cleaned up immediately. The cleanup materials **MUST** be autoclaved or managed as a **Regulated Infectious Waste**. Contact your WMC for assistance.

9.0 Definitions and Acronyms

NOTE *Use LANL document Definition Of Terms found at https://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=definitions&FileName=definitions.pdf for more definitions.*

9.1 Definitions

Acceptable Knowledge (AK).

Includes process knowledge, supplemental waste analysis data, and facility records or analysis as applied to waste characterization.

To utilize process knowledge for "Green is Clean," the generator **MUST** possess enough knowledge of the item's use and history to accurately make a determination of the following requirements:

- no spill or airborne release has occurred in the area since the most recent radiological survey;
- no direct contact between item and radioactive contamination has occurred;
- no tag or label which indicates radioactive or potentially radioactive contamination;
- not connected to a contaminated or activated system;
- no potential for activation;
- not used or located so that contamination is suspected; and
- no other reason to suspect the item is contaminated.

If the answer to any of these questions is yes or unknown, assume the item is LLW unless a survey of the item indicates that it is clean.

Appropriate Release Criteria (ARC).

Radiological criteria used to release equipment, material, and waste from RCAs and/or radiological areas as clean. ARC are defined for both surface contamination and volume contamination, specific to the media and radionuclides.

Approved Users.

Authorized users identified by the Hazardous Waste Satellite Accumulation Area (SAA) custodians, who have approval to use a specific SAA. SAA custodians **may** select all authorized users or a subset of the authorized user list.

Authorized Employees.

Workers who generate waste and have completed the required training and been authorized by their line management to perform these activities.

Authorized Operation.

Operation with an up-to-date Integrated Work Document (IWD) that has been authorized by line management.

Authorized Users.

Waste generators who have completed required training as specified by the STO training staff and documented in their UTrain Curricula.

Bioagent/Biohazard.

9.1 Definitions (cont.)

An organism or product of an organism that presents a risk to humans i.e., infectious microorganisms, biological allergens, and toxins, such as c. botulinum and legionella pneumophila).

Bioagent/Biohazard Toxin.

Any substance produced from a microorganism (e.g., bacterium, virus, fungus, or protozoan), that has the potential to cause injury or illness in humans.

Biosafety Level 1 (BSL-1).

A level that includes bioagents that are not known to cause disease in healthy adults.

Biosafety Level 2 (BSL-2).

A level that includes bioagents associated with human disease and hazards from autoinoculation, ingestion, and mucous membrane exposures.

Biosafety Level 3 (BSL-3).

A level that includes indigenous or exotic bioagents communicated through aerosols and that produce diseases with serious or lethal consequences.

Clean Waste.

Waste that is not radioactively contaminated as determined through use of AK or survey.

Compactible Waste.

Materials that are capable of undergoing volume reduction (e.g., paper, plastic, cardboard, cloth, small wood splints, rubber, and glass).

Green Is Clean.

The LANL LLW minimization program which specifies the requirements that allow for waste segregation within RCAs established for contamination control purposes.

Hazardous Waste.

As defined by the Resource Conservation and Recovery Act (RCRA), a Solid Waste is a hazardous waste if it is not excluded from regulation as a hazardous waste, exhibits any of the characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity), is listed in the regulations as a hazardous waste and has not been excluded, or is a mixture of a Solid Waste and a hazardous waste.

Hazardous Waste < 90 Day Storage Area (< 90 day area).

An area where hazardous or mixed waste **may** be stored for up to 90 days.

Hazardous Waste Satellite Accumulation Area (SAA).

A designated space located to serve a process, a room, or a suite of rooms for accumulating hazardous and mixed waste where the volume of hazardous waste **may** not exceed 55 gallons or the volume of acutely hazardous waste **may** not exceed one quart. The accumulation area **MUST** be located at or near the point of generation and be under the control of the generator/operator of the process generating the waste.

9.1 Definitions (cont.)

Low-Level Radioactive Waste (LLW).

Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel as defined in DOE Order 5820.2A, "Radioactive Waste Management." Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, **may** be classified as LLW, provided the concentration of transuranics is less than 100 nanocuries per gram of waste.

Mixed Waste.

Any material that is a hazardous waste that also contains a radioactive component.

Noncompactible Waste.

Materials not capable of being compacted or of undergoing volume reduction (e.g., metal materials with minimum void space and metal bricks). Note: HEPA filters and empty aerosol cans are noncompactible waste.

Nonradioactive Waste.

Waste that is known to contain no added (or concentrated Naturally Occurring Radioactive Material [NORM]) radioactive material by either monitoring and analysis, acceptable knowledge or both. Nonradioactive waste can be released to an appropriate facility that is not licensed to accept radioactive material, such as a sanitary or hazardous waste landfill.

Orphaned or Unknown Waste.

Any material or waste with an unknown origin, generator, constituent, or process; or any material or waste that was abandoned or does not have a defined owner.

Packaging.

The waste container; the term refers to the devices, including liners and closures, used in the packaging of waste. The waste package is the final configuration of the waste in its container ready for transport to the disposal site.

Radioactive Waste.

Solid, liquid, or containerized gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and is of negligible economic value considering costs of recovery. Radioactive waste has radioactive surface contamination present in excess of the unrestricted release levels in DOE 5400.5, or has volume contamination at statistically measurable levels above background.

Radioactive Waste Management Basis (RWMB).

Identifies physical and administrative controls for radioactive waste facilities, operations, and activities to ensure the protection of workers, the public, and the environment. The RWMB shall reference or define the conditions under which the facility may operate.

9.1 Definitions (cont.)

Radiological Controlled Area (RCA).

Any area to which access is managed to protect individuals from exposure to radiation or radioactive materials. In an RCA controlled for contamination, a reasonable potential exists for contamination to occur at levels in excess of those specified in DOE Order 5400.5, Table 1, or a reasonable potential exists for an individual to receive more than 0.1 rem committed effective dose equivalent (CEDE) during a year from intakes. In an RCA controlled for volume contamination, a reasonable potential exists for the presence of volume-contaminated materials that are <u>not</u> individually labeled. In an RCA controlled for external radiation, a reasonable potential exists for an individual to receive more than 0.1 rem during a year from external radiation fields.

Regulated Infectious Waste.

Liquid or semiliquid human blood or other potentially infectious material; contaminated items that release human blood or other potentially infectious materials in a liquid or semiliquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing human blood or other potentially infectious materials. Guidance Note: These wastes, as well as contaminated animal carcasses and bedding are regulated in the State of New Mexico as “infectious wastes,” which is a subcategory of New Mexico Special Waste.

SAA Custodian.

Person who has oversight of the SAA to help STO waste management ensure waste generators maintain the storage requirements for that SAA.

Solid Waste.

As defined by regulation promulgated under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act, unless otherwise excluded, any discarded material, either abandoned, recycled, or inherently waste-like which includes liquids, solids, semisolids, and/or contained gases. Solid Waste can be simply solid or special, hazardous, nonhazardous, radioactive (including transuranic), or mixed waste. Waste consisting solely of source, special nuclear, or byproduct material, as defined by the Atomic Energy Act, is exempt from the Solid Waste regulations as defined by RCRA. Environmental media (e.g., soil or water) is <u>not</u> Solid Waste unless it is destined for disposal.

9.1 Definitions (cont.)

Survey.

In the context of this document, monitoring of waste by an appropriate method (i.e., direct frisk or smear) for loose or fixed radioactive surface contamination to determine the proper waste characterization. To be released as clean, the item **MUST** satisfy the following conditions:

- Detection limits for survey instrumentation are appropriate for the Acceptable Release Criteria (ARC)
- Survey results indicate that the ARC is satisfied
- Interior surfaces or volumes are determined to be free of contamination based on documentation.

Suspect Radioactive Waste.

Waste that is generated in an area where radioactive materials are present but that <u>cannot</u> be verified as being radioactive or nonradioactive.

Transuranic (TRU) Waste.

Without regard to source or form, waste that is contaminated with alpha-emitting transuranic radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay and that have atomic numbers greater than 92.

Treatment/Storage/Disposal Facility (TSDF).

All contiguous land, and structures, other appurtenances, and improvements on the land used to treat, store, or dispose of waste.

Waste Characterization.

The determination of a waste's physical, radiological, and chemical characteristics with sufficient accuracy to permit proper segregation, treatment, storage, and disposal according to the permitted TSDF's waste acceptance criteria.

Waste Generator.

Any individual, and his or her line management, having direct line responsibility for operations that generate waste (for example, a research scientist or project manager). A waste generator **may** or **may <u>not</u>** be a member of an organization responsible for the facility or site where the waste is generated.

Waste Management Coordinator (WMC).

The individual responsible for coordinating waste management activities on behalf of the waste generators, line managers, facility managers, field project leaders, the waste management groups and other Laboratory organizations. The WMC also coordinates resolution of waste management issues on behalf of the waste-generating organization and reviews documents pertaining to waste management.

9.1 Definitions (cont.)

Waste Stream.

A waste or group of wastes from one or more processes or facility with similar physical, chemical, and/or radiological characteristics. These characteristics are usually grouped according to WAC treatment, storage, or disposal requirements.

Worker.

A Los Alamos National Security (LANS) employee, contract worker, or anyone who works at LANL.

9.2 Acronyms

AK	Acceptable Knowledge
DOE	Department Of Energy
DOT	Department Of Transportation
EMS	Environmental Management System
EPA	Environmental Protection Agency
FWCP	Facility Waste Certification Program
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC.
LLW	Low-Level Radioactive Waste
NFPA	National Fire Protection Agency
NMED	New Mexico Environment Department
NNSS	Nevada National Security Site
NORM	Naturally Occurring Radioactive Material
PCB	Polychlorinated Biphenyl
PPM	Parts Per Million
RCA	Radiological Control Area
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RLWTF	Radioactive Liquid Waste Treatment Facility
RWMB	Radioactive Waste Management Basis
SAA	Hazardous Waste Satellite Accumulation Area
STO	Science and Technology Operations
SWA	Special Waste Area
TRU	Transuranic
TSDF	Treatment/Storage/Disposal Facility
U(DEP)	Depleted Uranium
UWA	Universal Waste Area
WAC	Waste Acceptance Criteria

9.3 Acronyms (cont.)

WMC	Waste Management Coordinator
WPF	Waste Profile Form

10.0 RESPONSIBILITIES

10.1 STO Facility Operations Director

- Ensure that the facility complies with Laboratory, DOE, and governmental orders and requirements, and institutional safety management programs.
- Establish and maintain the safety, security, and environmental compliance envelope.
- Approve and issue procedures that accurately establish administrative, technical, and response guidance for the overall safe, secure, and environmentally compliant operation of the assigned facilities.
- Request and ensure that FOD personnel (operations, maintenance, engineering, ESH&Q, waste management, technical support, and administrative personnel) have appropriate training and qualifications to support facility and programmatic activities.
- Perform field observations and assessments to ensure that activities are safely and correctly conducted.
- Maintain a proactive preventative maintenance program to ensure that biological laboratory engineering controls and emergency equipment (e.g., ventilation systems, detectors, shutoff devices, and emergency eyewash and safety showers) are in proper operating condition.
- Inform on-site subcontractors of the presence and identity of biological hazards in their immediate work areas.

10.2 DSESH-STO Environment, Safety and Health Manager

- Support and enable work execution to promote safety and compliance in accordance with applicable ESH requirements.
- Manage deployed resources to support facility operations and ESH program implementation.
- Perform periodic walk downs to identify noncompliant storage and or uncontrolled excess materials.
- Work with line management to ensure the deployed workers' safety.
- Review facility- and programmatic-specific ESH data for trends, and involve Subject Matter Experts (SMEs) to make recommendations for improvement including waste reduction and pollution prevention.
- Work with institutional support organizations to coordinate customer involvement in regulatory inspections and audits.

10.3 STO Operations Manager

- Maintain safety, environmental compliance envelope, and facility physical security.
- Prepare and issue or recommend procedures that accurately establish administrative, technical, and response guidance for the overall safe, secure, and environmentally compliant operation of the assigned facilities.
- Ensure that the facilities comply with Laboratory, DOE, and governmental orders and requirements, and institutional safety and environmental management programs.
- Perform field observations and assessments to ensure that activities are safely and correctly conducted.

10.4 Facility Responsible Associate Director (RAD)

- Own the facility safety, security, and environmental compliance envelope.
- Set and communicate expectations for the safe, secure, and environmentally compliant operation of the facility.
- Establish the environmental improvement strategy for the directorate, including an ISO 14001 compliance Environmental Action Plan according to DOE O 450.1A, *Environmental Protection Program*.
- Before vacating any facility, ensure that all excess materials, property, wastes, and equipment are vacated and that all requirements in Form 1669, *Workspace Inspection Form*, are completed.

10.5 Responsible Line Manager (Group and Center Leaders)

- Define the work in sufficient detail to assess the safety, security, and environmental compliance risks.
- Identify and analyze work and environmental hazards and grade these hazards to determine IWM and environmental control requirements.
- Ensure all new and modified work is evaluated for environmental risks and controls using the PR-ID according to PD400, *Environmental Protection*.
- Ensure that all workers are trained, qualified, and authorized to perform their assigned work in accordance with P781-1, *Conduct of Training Manual*.
- Establish effective controls to reduce risks to an acceptable level and document them in IWDs so that the workers can understand when and how they are to be used.
- Ensure that work proceeds in a safe, secure, and environmentally responsible manner in accordance with the IWD and PR-ID requirements.
- Determine the competence and commitment of workers to perform specific work assignments in a safe, secure, and environmentally responsible manner and authorize them as appropriate.
- Monitor work to ensure that it is executed in a safe, secure, and environmentally responsible manner in accordance with the IWD.
- In emergencies, ensure that personnel know who to call and what to do. For medical emergencies, life-threatening situations such as a fire, explosion, bomb threat, or terrorist attack, call 911. Callers using mobile phones should be prepared to state the location of the emergency as precisely as possible. For all other situations requiring immediate response or dispatch, to include abnormal/unusual events, unattended packages, spills, leaks, and contamination, contact Emergency Management by calling the EOSC at 667-6211.
- Institute biosafety measures in accordance with P101-15.

10.6 DSESH-STO Waste Management Coordinator (WMC)

- Act as the primary Point Of Contact (POC) on waste-related issues and provide guidance and assistance to maintain compliant operations support.
- Coordinate waste management activities on behalf of waste generators, line managers, facility managers, field project leaders, waste management groups, and other Laboratory organizations.
- Coordinate the resolution of waste management issues on behalf of the waste generating organization.

- Oversee waste generators in the implementation of cradle-to-grave controls for generation, handling, storage, and disposal of facility and process waste.
- Maintain familiarity with waste-generating processes, review scopes of work to ensure that waste management is properly addressed, and review and approve work orders for work that generates regulated wastes.
- Provide guidance to generators in characterizing waste, developing Acceptable Knowledge documentation and preparing Waste Profile Forms.

10.6 DSESH-STO Waste Management Coordinator (WMC) (cont.)

- Walkdown Waste Profile Form extensions with generators.
- Disseminate waste management information to generators in their facilities.
- Support storage, packaging, and labeling of waste.
- Coordinate waste shipments as needed.
- Conduct periodic inspections and monitoring to maintain compliant and efficient waste management operations, support the completion and implementation of waste certification plans, and assist with pollution prevention and waste minimization opportunities.
- Manage facility-owned regulated storage (i.e., Treatment, Storage, and/or Disposal [TSD], less-than-ninety day, or Satellite Accumulation Areas [SAAs]) in accordance with Laboratory requirements.
- Support management of generator-owned regulated storage (i.e., TSD, less-than-ninety day, SAA) by providing surveillance and regulatory guidance in accordance with service agreement and Laboratory requirements.
- Assist operating groups and property custodians in minimizing accumulation or storage of excess materials and recommend reuse, recycle, or disposition of expired materials.
- Participate in the Departure Process by validating waste disposal requirements on Form 1669, Workplace Inspection Form.
- Serve as POC during waste management audits and assessments.
- Assist the Waste Services Manager (WSM) with facility and programmatic Waste Certification Program Plans.
- Provide guidance to waste generators in identifying disposal paths for waste, and support requests for DOE approval of No Disposal Pathway waste.
- Report events related to the improper generation, handling, storage, and disposal of waste, including spills, releases, leaks, or discharges to the WSM and the FOD.
- Stop any work activity thought to be in violation of approved waste generation, handling, storage, or shipping procedures and standards.

10.7 Generators (Authorized/Approves Users)

- Responsible for waste management from cradle to grave.
- Make waste determinations.
- If the WMC and management agree a “no path” waste stream must be generated, work with the WMC to prepare a “Waste with No Disposal Path” approval package.
- Assist in preparing and reviewing waste management sections of Integrated Work Documents (IWDs), waste minimization plans, waste management plans, and project documentation.
- Minimize waste generation and/or segregate waste streams to reduce the costs of waste management and meet the Treatment, Storage, and/or Disposal Facility (TSDF) waste acceptance criteria.
- Generators who own less-than-90--day waste accumulation areas: ensure inspections are performed weekly and/or when waste is actively managed.
- Manage waste in accordance with LANL P409 and its associated tools and maintain waste management records.
- Provide the TSDF accurate and complete documented waste characterization information ensuring that regulated constituents in waste streams are identified.
- Notify the Facility Operations Directors (FODs) or designees—or, if unavailable, notify Emergency Management and Response (EM&R)—and responsible WMCs of a release of waste or wastewater into the environment or of an accidental discharge to a wastewater treatment facility.
- Complete and sign *Waste Profile Form*s (Form 1346, *Waste Profile Form*), and transmit them, along with any necessary supporting information, to the WMC for review and signature.
- Submit a STO Service Request for each service requested involving waste.

11.0 RECORDS

Ensure that documents generated by the performance of this procedure are processed as follows:

Record Identification	Record Type Determination	Protection/Storage Methods	Processing Instructions
Original Inspection Record Forms for each <90 day area Copies of the results of the internal and ENV-RCRA waste area inspection reports FWCP	QA Record	WMC **SHALL** store in the DSESH-STO Waste Management Files for three years, and implement a reasonable level of protection to prevent loss and degradation.	When the records are ready for final disposition, the record is transferred to Records Management in accordance with SR-0011-PRO-ALL-REC MGMT, STO Document Development And Maintenance.
Copies of training records FWCP Training	Non-record	Training Specialist **SHALL** store for three years and implement a reasonable level of protection to prevent loss and degradation.	Destroy when no longer needed.
Copies of WPFs Copies of waste characterization documentation Copies of acceptable knowledge documentation for waste <u>not</u> covered by an IWD Copies of Disposal Request Forms Copies of the waste manifest packages Original Waste Manifests Copies of Non Conformance Reports	Non-record	WMC **SHALL** store in the DSESH-STO Waste Management Files for an indefinite period of time.	Never to be destroyed.
Autoclave logs Autoclave calibration results Geobacillus stearothermophilus tests	QA Record	Waste generating organization **SHALL** store for three years and implement a reasonable level of protection to prevent loss and degradation.	Destroy when no longer needed.

12.0 REFERENCES

CFR 40, Protection of Environment
LANL Procedure P930-1 LANL Waste Acceptance Criteria (WAC)
LANL Procedure P409 Waste Management
LANL Procedure P330-6 Nonconformance Reporting
LANL Procedure P313 Roles, Responsibilities, Authorities, and Accountability
LANL Procedure P101-15, Biological Safety
OST 402-530-00 Biosafety Manual
B-DOC-100 Biosafety User's Manual
SR-0011-PRO-ALL-REC MGMT, Records Management Procedure

13.0 APPENDICES

APPENDIX 1, HAZARDOUS WASTE DISPOSAL PROCESS FLOW CHART
APPENDIX 2, NFPA FLAMMABLE MATERIAL VOLUME LIMITS
APPENDIX 3, HAZARDOUS WASTE LABELS
APPENDIX 4, RADIOACTIVE WASTE LABEL

APPENDIX 1

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HAZARDOUS WASTE DISPOSAL PROCESS FLOW CHART

STO Service Request submitted to DSESH-STO Waste Management

▼

Meeting scheduled between the WMC and the Waste Generator

▼

Waste generated and accumulated in a SAA/analysis requested/WPF completed in WCATS

▼

Approved WPF QA checked by DSESH-STO Waste Management

▼

Waste packaged for shipment

▼

Waste Generator completes the Waste Acceptance Form or the Waste Item Inventory form

▼

STO Service Request submitted to DSESH-STO Waste Management requesting disposal

▼

DSESH-STO WMC completes the Waste Item in WCATS

▼

DSESH-STO WMC completes and submits the Disposal Request in WCATS

▼

Shipping Container labeled for shipment

▼

Waste Manifest completed and signed

▼

Waste transported to TSDF by LANL or approved contractor

▼

WMC awaits original Waste Manifest

▼

Original Waste Manifest received within 30 days

▼

Process completed and disposal package filed

APPENDIX 2
Page 1 of 1

NFPA FLAMMABLE MATERIAL VOLUME LIMITS

Flammable waste **MUST** satisfy NFPA requirements:

Ensure that there are no ignition sources near the SAA.

Ensure that non-DOT rated flammable waste containers do not exceed the following volumes:

Flash Point	Boiling Point	Volume	Container Type
< 73 °F	< 100 °F	1 pt	Glass
< 73 °F	< 100 °F	1 gal	Metal or Plastic
< 73 °F	≥ 100 °F	1 qt	Glass
< 73 °F	≥ 100 °F	5 gal	Metal or Plastic
≥ 73 °F and < 100 °F	-	1 gal	Glass
≥ 73 °F and < 100 °F	-	5 gal	Metal or Plastic
100 °F to 140 °F	-	1 gal	Glass
100 °F to 140 °F	-	5 gal	Metal or Plastic
140 °F to 200 °F	-	1 gal	Glass
140 °F to 200 °F	-	5 gal	Metal or Plastic

APPENDIX 3
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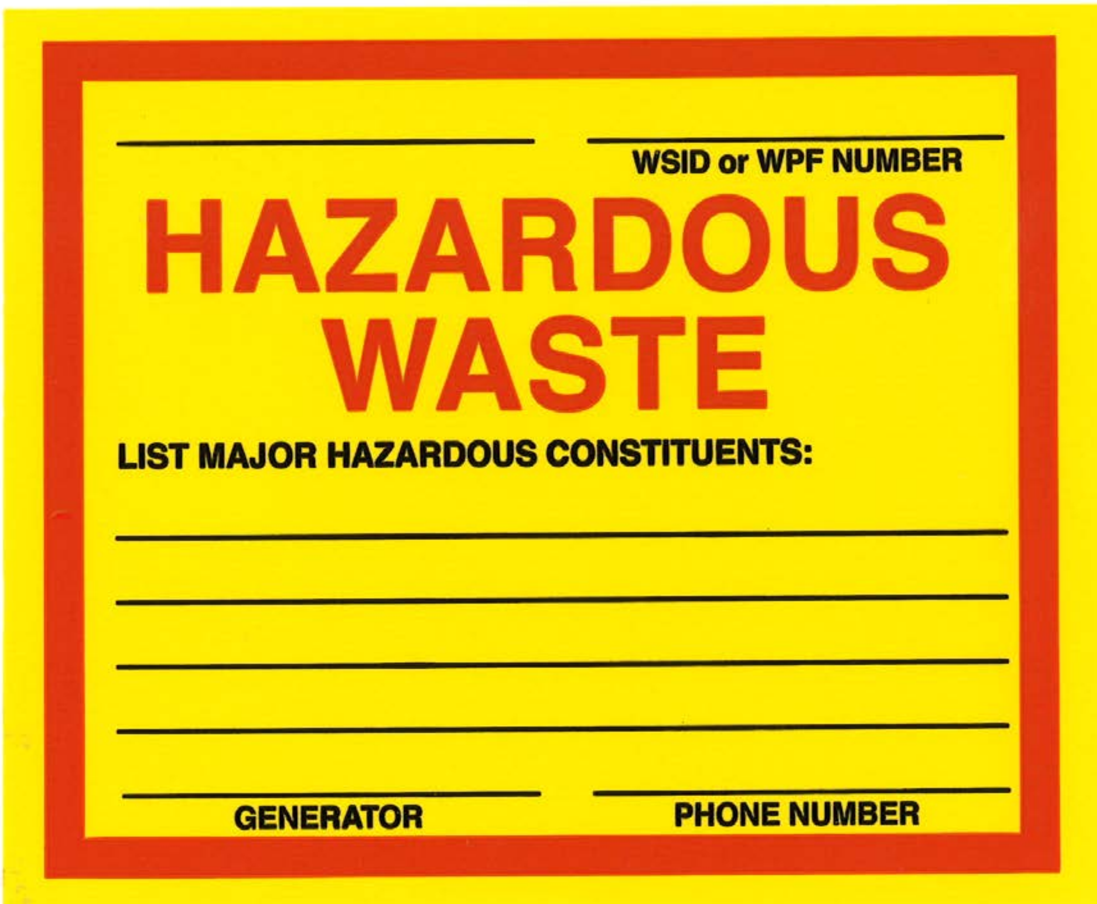
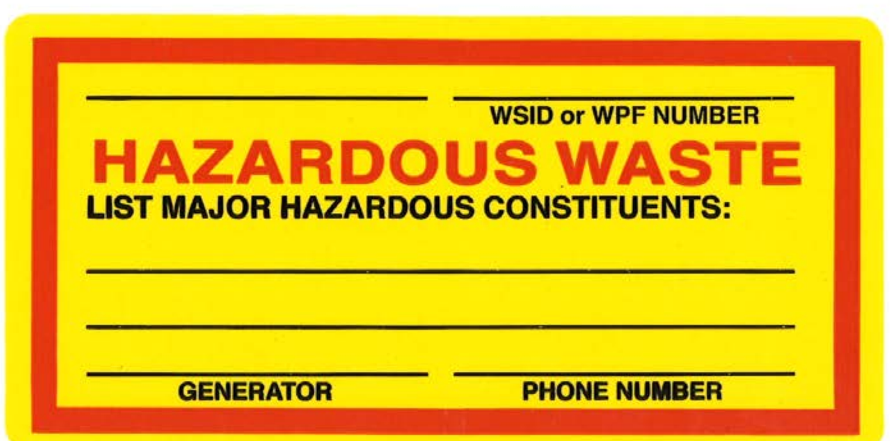
HAZARDOUS WASTE LABELS





APPENDIX 4
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RADIOACTIVE WASTE LABEL

(Black on yellow background)